

Sex in the Digital Age

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*IT IS NOT THE CRITIC
WHO COUNTS;*

*THE CREDIT BELONGS
TO THE MAN WHO IS
ACTUALLY IN THE ARENA,*

WHO STRIVES VALIANTLY;

*WHO ERRS, WHO COMES
SHORT AGAIN AND AGAIN;*

*WHO KNOWS
GREAT ENTHUSIASMS;*

*WHO SPENDS HIMSELF
IN A WORTHY CAUSE;*

*WHO AT THE BEST
KNOWS IN THE END*

*THE TRIUMPH OF
HIGH ACHIEVEMENT,*

AND WHO AT THE WORST,

*IF HE FAILS,
AT LEAST FAILS
WHILE DARING GREATLY.*





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A photograph of a network equipment rack in a server room. The rack is filled with various electronic components, including power supplies and network switches. A large, messy pile of network cables is on the floor in front of the rack, with many cables running vertically up the front of the rack. The cables are of various colors (blue, white, black) and are tangled together. The background is a plain, light-colored wall.

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EVER.**
Technology is connecting us in all-new intimate ways. Plug in, turn on, get off.

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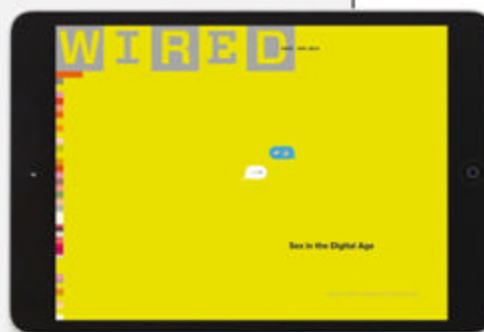
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STRONG ARMS, AND
A BIG BUTT

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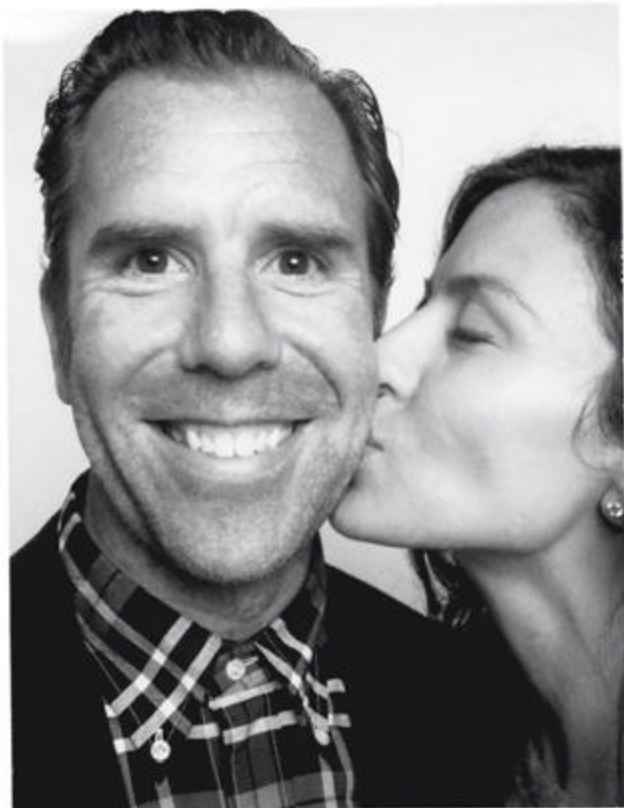
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MY FAVORITE

SPRING EVENINGS in New York City can be magic. Sometimes a lingering winter chill will settle in just after dark, but I remember one Tuesday in April 2010 as particularly spectacular: The air was cool instead of cold, carrying the first hint of a thaw, and it was crystalline—the better to watch the sun set from the window of my cab headed downtown. I was wearing a glen plaid blazer, one I'd settled on just an hour earlier after a half day of indecision. I remember these details so well because that evening was the first time I met the woman who would become my wife. ¶ But not exactly the first time. Maybe I fretted over the details because she first laid eyes on me on a computer screen, the two of us introduced via Match.com profiles. In fairness, I was steering the dating site's algorithm a bit: Even though I lived in San Francisco, I had tweaked my zip code to the New York City address where I stayed when in town on business. So after our initial digital introductions (a Favorite from her, a message from me, calls and then texts and then emails), we decided to meet in person. I wondered whether the reality would live up to the virtual—never a sure thing. In Amy's case, reality did much, much better. ¶ We had arranged to meet for dinner at Gramercy Tavern. I pushed through the crowd always clustered in the foyer and, scanning the bar, immediately recognized the glossy sable curls I knew from her profile. She was wearing a black leather jacket and dark jeans, and she was on her cell. A second

she wanted to talk to me on my birthday!

we dream about it on every anniversary.

I knew people who had met online, so I thought, "why not?"

Samn straight, it was my birthday!

It was literally three seconds later.

Actually, it was a short black dress.

later, she turned around, still on the phone, and looked toward the door. As she recognized me, she smiled. I made my way over and heard her tell her mom she'd call back later.

Weeks earlier, when I had seen Amy's photographs on Match, I had been instantly smitten, but in person she was even more phenomenal. She gave me a hug, and we exchanged pleasantries. She smelled wonderful, like morning light. I was suddenly feeling very nervous. Mediated by screens and keyboards, I'd been able to finely calibrate my so-called charm. But now, face-to-face, the technology couldn't help me.

We sat down and worked through the first date punch list: jobs, friends (drink orders), interests, favorite travels (menu selections), exes, families, hobbies. Most of it we already knew from our online profiles, honestly. But now that all seemed unacceptably low-resolution. I lose some command of detail here because time sped up so profoundly, a blur of listening, talking, and laughing. Before I knew it, we were demolishing an insane cherry brown butter cake while I worked on schemes to get this amazing woman to see me again. Outside, I hailed Amy a cab and put her in it. I can't remember if I asked to see her again, because my heart was pounding out of my chest and my brain was imploring me—begging me—to kiss her good-night. But I was petrified of being too forward, so I didn't, and as I waved good-bye, a group of four drunk Wall Street bankers started yelling at me. "Kiss her, you idiot! What the hell is wrong with you!" and "Oh man! You blew it!"—followed by cat-calls and laughter.

Thirty seconds later I turned to technology once more, breaking a basic rule: I texted her. But she answered. And we made plans to walk the High Line that Saturday afternoon. Guess what? I kissed her, not even an hour into our second date.

That sealed the deal. I knew.

Scott & Amy

SCOTT DADICH
Editor in Chief

He said he was sitting in bed, typing on his iPad. (They were brand-new.) He name-dropped the iPad!

A CLASSIC SENSE OF STYLE.
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MODERN HERITAGE

Welcome to Lincoln Black Label. An exclusive ownership experience that reflects the highest expression of the Lincoln brand. A curated collection of designer interior themes and a host of exclusive membership privileges, such as complimentary detailing to ensure that your vehicle looks as perfect as it did the day you purchased it.* The Modern Heritage theme (pictured here) features a clean aesthetic in striking black and white with Crimson accents. A contemporary twist for those with an eye for elegant simplicity. We invite you to learn more about Lincoln Black Label online.

Lincoln.com/blacklabel

*SEE A LINCOLN BLACK LABEL DEALERSHIP FOR COMPLETE DETAILS.



READ THIS NOW!

Zzzt. Feel that? It's your phone. Something's happening in the world and someone wants to tell you about it. Actually, not just someone. *Everyone*. News publishers are waging a bloody war to get your eyeballs on their content. So for our January issue, Mat Honan embedded with the frontline combatants, new new-media services like BuzzFeed and Circa, to find out who's winning and how. His conclusion? "Nobody has it figured out." (Except maybe Honan, who after closing the story left WIRED for BuzzFeed.) Oh, hey, completely unrelated, we're relaunching WIRED.com on all platforms, and it's amazing.

RE: "WHAT THE WORLD NEEDS IS A SMART GOSSIP SITE," SAYS JESSICA WILLIAMS

"PLEASE HIRE ME, JESSICA! I'M PERFECT FOR YOUR UNDERPAID AND OVERWORKED TEAM!"

Maria on WIRED.com

"Jessica Williams has never, not once, disappointed me. Everything she says, every appearance on *The Daily Show*, puts a grin on my face. She exhales irony with every breath—my favorite form of humor."

urgelt on WIRED.com



RE: INSIDE THE SECRET WORLD OF STOLEN SMARTPHONES

"I'll just stick with my flip phone."

Ant con on WIRED.com

"The security app Lookout is great. I have it on my phone, my wife's phone, and my Google Nexus 9 tablet. It scans for malicious apps and URLs, and the locator is fast and very accurate. I'm not a company rep, just a customer who believes in the product."

Ctrl-alt-del on WIRED.com



RE: THE FUTURE OF MEDIA

"I don't want BuzzFeed publisher Dao Nguyen telling me what to read. What I do want is software smart enough to figure out my interests from the thousands of posts I've already made here on Google+ and feed me new stories based on that! Any media types out there game?"

Dan O'Shea on Google+

"Because of this article, I started using the Circa app. Great article, great app."

David Wall (@balao_mo) on Twitter

"When I first saw the cover of 23.01, I wondered if the editors understood the irony implicit in the words. After all, what is WIRED if not an 'all-new, buzz-fueled American media machine'? Then I followed the flowchart on the last page to the 'WIRED' circle. Being a longtime software designer and developer, going back to the days when flowcharts came before code, WIRED must be where I belong. And yes, you do understand the irony, oh so well."

Ben Myers via email



RE: "PHOTON TORPEDO": AROUND THE WORLD ON NOTHING BUT SOLAR

"Am I the only one who noticed that the aircraft's captain is named Piccard?"

Travis on WIRED.com

Senior editor Sarah Fallon responds: Well spotted! Inventors Jean and Jeanette Piccard piloted a balloon to a record-setting altitude in 1934; in 1960, Auguste Piccard (Jean's twin brother) and his son Jacques designed the world's deepest-diving submersible. *Star Trek* creator Gene Roddenberry named Captain Jean-Luc Picard after this famous (and ongoing!) line of Swiss explorers.

FROM THE EXECUTIVE PRODUCERS OF
HOMELAND AND HEROES



THE DEEPER YOU DIG, THE FURTHER
YOU GET FROM THE TRUTH.

DIG

EVENT SERIES MARCH 5
THURSDAYS 10/9C

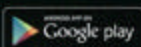
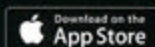
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RE: "ONE OF US": WIRED'S ADAM ROGERS TAKES A NERD CRUISE

"Terrific article. You helped explain something about my own personality that I have had a difficult time understanding myself. Thank you."

Wm. David Shepherd on Facebook

"Adam, I met you on the cruise. I thought you were lovely. Come in 2015, leave your notebook at home so you don't hide behind it, and get yourself a tiara. I can loan you one. You can find your niche, and it won't be alone in a corner thinking no one likes you. Actually, there are many nerds who stand there with you. Including me."

Womyn2me on WIRED.COM

Articles editor Adam Rogers replies: That's kind of you. My ambivalence didn't arise so much from not finding my niche as from being unaccountably uncomfortable standing in one so well tailored.

RE: "UNDER THE INFLUENCE": HOW TECH PRODUCTS GET YOU HOOKED

"I KNEW SOMETHING WAS GOING ON WITH THIS! MANIPULATION AT ITS FINEST, AND WE DANCE LIKE MONKEYS."

Gea Leigh Haff (@gealeighhaff) on Twitter



RE: "GOOD VIBRATIONS": TECH THAT TALKS THROUGH YOUR SKIN

"If horses and other animals can be guided by nudging them one way or the other, is it really so newsworthy to learn that humans respond to the same type of stimulus? Still, if it can keep people from dragging out their cell phones just a little less often while driving, I'm all for it."

Samhillxx on WIRED.COM

RE: "THE PHONE TRAP": BUY AN LTE-ENABLED TABLET INSTEAD

"Idly wondering if voice plans are to mobile devices what landlines are to homes: vestigial and obsolete."

Paul Kedrosky (@pkedrosky) on Twitter



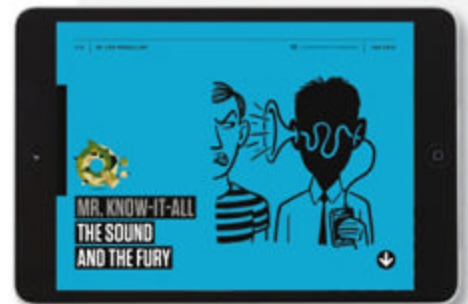
"In five years or so this will be good advice. Until then it's a plan for people who own a Bluetooth headset, don't mind carrying an iPad everywhere, and live in an area with reliable and consistent data service."

Geoff Hinkle on Facebook

RE: MR. KNOW-IT-ALL ON OVERPUMPED EARBUD VOLUME

"Hearing the tinny stuff coming from someone's earbuds is annoying, but I'm old enough to remember when every single car (or so it seemed) going by your house blasted not-my-music loud enough to be heard a block away. And of course they had long ago burned out their speakers, so the vibration was enough to set your teeth on edge. I'll take a little earbud noise over that every day of the week."

Chakolate on WIRED.COM



UNDO

Paul F. Tompkins' last name does not have an h in it ("One of Us," issue 23.03).

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SATELLITE FOCUS
 ○ SPACE ● EARTH ● BOTH

SATELLITE NAME

Satellite mission

LAUNCH ———— END*

MISSION STATE

ACTIVE

DECOMMISSIONED

*Some craft continue to collect data after end of initial mission.

SCALE

1 meter

● SMAP - Soil moisture
 2015 ———— 2018

● LANDSAT 8 - Earth-science
 observations
 2013 ———— 2018

● HINODE - Solar magnetism
 2006 ———— 2009

● GPM CORE OBSERVATORY
 Precipitation
 2014 ———— 2017

● CINEMA 1 - Space weather
 2012 ———— 2015

● GEOTAIL - Earth's magnetotail
 1992 ———— 1996

● CINEMA 2 & 3 - Space
 weather
 2013 ———— 2014

● CORIOLIS - Ocean winds and
 solar mass ejections
 2003 ———— 2006

● EO-1 - Tests instruments;
 provides images and data
 2000 ———— 2001

● WIND - Solar wind
 1994 ———— 1999

● SAC-D - Ocean salinity
 2011 ———— 2016

● MAGNETOSPHERIC MULTI-
 SCALE - Magnetic reconnection
 2015 ———— 2017

● GOES-15 - Weather
 2010 ———— 2020

● OCO-2 - Atmospheric CO₂
 2014 ———— 2016

● GOES-14 - Weather
 2009 ———— 2019

● NOAA-19 - Weather
 2009 ———— 2011

● NOAA-18 - With NOAA-19,
 observes every part of Earth
 at least twice every 12 hours;
 supports search-and-rescue
 2005 ———— 2007

● O/OREOS - A test for nanosat
 astrobology experiments
 2010 ———— 2011

● GCOM-W1 - Water circulation
 systems
 2012 ———— 2017

● SDO - Impact of solar activity
 on space weather
 2010 ———— 2015

● VAN ALLEN PROBES A & B
 The sun's influence on our planet
 2012 ———— 2014

● AIM - Polar mesospheric clouds
 2007 ———— 2009

● THEMIS A, D & E - Auroras
 2007 ———— 2009

● FERMI GAMMA-RAY SPACE
 TELESCOPE - Dark matter,
 black holes, and gamma-ray bursts
 2008 ———— 2013

● GOES-13 - Weather over the
 Atlantic Ocean
 2006 ———— 2016

● CALIPSO - Clouds and aerosols
 2006 ———— 2009

● CLOUDSAT - Clouds and
 aerosols
 2006 ———— 2008

● SUZAKU - Hot plasmas and
 the evolution of the universe
 2005 ———— 2016

● TIMED - The mesosphere and
 lower thermosphere/ionosphere
 2001 ———— 2003

● NUSTAR - Collapsed stars,
 black holes
 2012 ———— 2014

● SWIFT - Gamma-ray bursts
 2004 ———— 2006

● SPITZER SPACE
 TELESCOPE - Deep space
 2003 ———— 2006

● IRIS - Solar atmosphere
 2013 ———— 2015

● INTEGRAL - Gamma rays
 2002 ———— 2018

● IBEX - Solar-system boundary
 2008 ———— 2010

● AQUA - Water cycle
 2002 ———— 2008

● GRACE-1 & -2 - Earth's
 gravity field
 2002 ———— 2007

● FIREFLY - Lightning and
 terrestrial gamma-ray flashes
 2013 ———— 2014

● RHESSI - Particle acceleration;
 energy release in solar flares
 2002 ———— 2004

● JASON 2 - Sea surface height
 2008 ———— 2011

● SORCE - Solar irradiance
 2003 ———— 2008

● SAC-C - Earth's atmosphere,
 ionosphere, and geomagnetic field
 2000 ———— 2004

● FIREBIRD-U1, -U2, -U3 & -U4
 Radiation belts and space weather
 2013 ———— 2015

● TERRA - Flagship satellite of
 Earth-observing systems
 1999 ———— 2005

● LANDSAT 7 - Earth-science
 observations
 1999 ———— 2005

● FORTE - Lightning from space;
 nuclear event detection
 1997 ———— 1998

● NOAA-15 - A backup to other
 NOAA satellites
 1998 ———— 2000

● TRMM - Tropical and
 subtropical rainfall
 1997 ———— 2000

● CXO - Deep space
 1999 ———— 2004

● SUOMI NPP - Climate change
 2011 ———— 2016

● ACRIMSAT - Solar irradiance
 1999 ———— 2004

● HUBBLE SPACE TELESCOPE
 Deep space
 1990 ———— 2017

SCIENCE FROM ABOVE

A visual guide to US research satellites.

Rain. Ocean waves. Dark matter, black holes, gamma-ray bursts, and other mysteries. To study these things it helps to have a satellite. We're lucky that the US has plenty—nearly 60 research birds up in the ether, peeping down at the ground or scanning as far as the edge of the universe. And the star fleet is only getting more interesting: In March, NASA launches the Magnetospheric Multiscale mission—four identical satellites that will orbit in a pyramid formation to take measurements of a phenomenon called magnetic reconnection, which causes (*gah!*) giant space explosions. From the granddaddy Hubble telescope to itty-bitty cutie-pie CubeSats, the science space armada is shaping up to be a powerful force. —GRACE DOBUSH



FLYING BLIND


THE TECH-UNFRIENDLY SKIES

ON FRIDAY, September 26, 2014, a telecommunications contractor named Brian Howard woke early and headed to Chicago Center, an air traffic control hub in Aurora, Illinois, where he had worked for eight years. He had decided to get stoned and kill himself, and as his final gesture he planned to take a chunk of the US air traffic control system with him. ¶ Court records say Howard entered Chicago Center at 5:06 am and went to the basement, where he set a fire in the electronics bay, sliced cables beneath the floor, and cut his own throat. Paramedics saved Howard's life, but Chicago Center, which controls air traffic above 10,000 feet for 91,000 square miles of the Midwest, went dark. Airlines canceled 6,600 flights; air traffic was interrupted for 17 days. Howard had wanted to cause trouble, but he hadn't anticipated a disruption of this magnitude. He had posted a message to Facebook saying that the sabotage

“should not take a large toll on the air space as all comms should be switched to the alt location.” It's not clear what alt location Howard was talking about, because there wasn't one. Howard had worked at the center for nearly a decade, and even he didn't know that.

At any given time, around 7,000 aircraft are flying over the United States. For the past 40 years, the same computer system has controlled all that high-altitude traffic—a relic of the 1970s known as

BY SARA BRESELOR



Host. The core system predates the advent of the Global Positioning System, so Host uses point-to-point, ground-based radar. Every day, thousands of travelers switch their GPS-enabled smartphones to airplane mode while their flights are guided by technology that predates the Speak & Spell. If you're reading this at 30,000 feet, relax—Host is still safe, in terms of getting planes from point A to point B. But it's unbelievably inefficient. It can handle a limited amount of traffic, and controllers can't see anything outside of their own airspace—when they hand off a plane to a contiguous airspace, it vanishes from their radar.

The FAA knows all that. For 11 years the agency has been limping toward a collection of upgrades called NextGen. At its core is a new computer system that will replace Host and allow any controller, anywhere, to see any plane in US airspace. In theory, this would enable one air traffic control center to take over for another with the flip of a switch, as Howard seemed to believe was already possible. NextGen isn't vaporware; that core system was live in Chicago and the four adjacent centers when Howard attacked, and this spring it'll go online in all 20 US centers.

But implementation has been a mess, with a cascade of delays, revisions, and unforeseen problems. Air traffic control can't do anything as sophisticated as Howard thought, and unless something changes about the way the FAA is managing NextGen, it probably never will.

This technology is complicated and novel, but that isn't the problem. The problem is that NextGen is a project of the FAA. The agency is primarily a regulatory body, responsible for keeping the national airspace

safe, and yet it is also in charge of operating air traffic control, an inherent conflict that causes big issues when it comes to upgrades. Modernization, a struggle for any federal agency, is practically antithetical to the FAA's operational culture, which is risk-averse, methodical, and bureaucratic. Paired with this is the lack of anything approximating market pressure. The FAA is the sole consumer of the product; it's a closed loop.

The first phase of NextGen is to replace Host with the new computer system, the foundation for all future upgrades. The FAA will finish the job this spring, five years late and at least \$500 million over budget. Lockheed Martin began developing the software for it in 2002, and the FAA projected that the transition from Host would be complete by late 2010. By 2007, the upgraded system was sailing through internal tests. But once installed, it was frighteningly buggy. It would link

planes to flight data for the wrong aircraft, and sometimes planes disappeared from controllers' screens altogether. As timelines slipped and the project budget ballooned, Lockheed churned out new software builds, but unanticipated issues con-

tinued to pop up. As recently as April 2014, the system crashed at Los Angeles Center when a military U-2 jet entered its airspace—the spy plane cruises at 60,000 feet, twice the altitude of commercial airliners, and its flight plan caused a software glitch that overloaded the system.

Even when the software works, air traffic control infrastructure is

THE UPGRADED
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\$500M
OVER BUDGET.

SARA BRESELOR (@sarabreselor)
wrote about the history of
maritime dining in issue 23.01.





not prepared to use it. Chicago Center and its four adjacent centers all had NextGen upgrades at the time of the fire, so nearby controllers could reconfigure their workstations to see Chicago airspace. But since those controllers weren't FAA-certified to work that airspace, they couldn't do anything. Chicago Center employees had to drive over to direct the planes. And when they arrived, there weren't enough workstations for them to use, so the Chicago controllers could pick up only a portion of the traffic. Meanwhile, the telecommunications systems were still a 1970s-era hardwired setup, so the FAA had to install new phone lines to transfer Chicago Center's workload. The agency doesn't anticipate switching to a digital system (based on the same voice over IP that became mainstream more than a decade ago) until 2018. Even in the best possible scenario, air traffic control will not be able to track every airplane with GPS before 2020. For the foreseeable future, if you purchase Wi-Fi in coach, you're pretty much better off than the pilot.

A big, high-risk infrastructure upgrade like NextGen will never move as fast as change associated with consumer technology, but the real hurdles are not technical, they're regulatory. In the private sector, new technologies can be developed freely regardless of whether the law is ready for them. Think of Uber, Lyft, and Airbnb: Outdated regulations slowed them down, but consumer demand is forcing the law to evolve. This back-and-forth is what lets tech companies move fast and break things without risking our safety. But when the government upgrades its technologies, regulations intercede before a single line of code is written. The government procurement process

is knotted with rules and standards, and new technology has to conform to those rules whether or not they're efficient or even relevant. These issues screwed up HealthCare.gov and are screwing up the Department of Veterans Affairs and a dozen other agencies that need computers and software that work. The current process stifles innovation from the start and mires infrastructures like NextGen, which need to carry us far into the future, in the rules of today.

The government needs to change its procurement process, and it's got to let go of its stranglehold on air traffic control. Privatization isn't necessarily the answer. Canada, the UK, Germany, Sweden, and Australia operate air traffic control through various separate entities, from semiprivate to nonprofit to government corporations, that help facilitate the necessary push and

FOR THE FORESEEABLE FUTURE, IF YOU PURCHASE WI-FI IN COACH, YOU'RE PRETTY MUCH BETTER OFF THAN THE PILOT.

pull between technological risk-taking, regulatory caution, and pressure from end users.

The first real pressure on the FAA to show results came, ironically, from Howard. He forced what was essentially the first real-time operational test of the new system. When NextGen faltered, the program faced a level of widespread public scrutiny that it had previously evaded, and the FAA had to respond. The agency published a review of its contingency processes, including new plans to enable control centers to assist each other in emergencies. Brian Howard, hell-bent on destruction, was the best thing to happen to our air traffic control system in years. ■



FIRST TO MARKET TELEMEDICINE

Time-strapped snuffle sufferers now have an alternative to tedious hours spent in germ-ridden waiting rooms: house calls (kinda). The health care industry is at last starting to embrace treating patients via video or text—with well-scrubbed hands, of course. —VICTORIA TANG

First Opinion

\$6 million raised in a Series A round (December 2014)

For \$9 per month, patients text basic health queries to a pre-matched doctor at any time of day and expect a response within five minutes. Hypochondriacs rejoice!

Teladoc

\$50.3 million raised in a Series F round (September 2014)

If your insurance offers it (and for more than 10 million members it already does), you can get a video or phone consult 24/7.

Doctor on Demand

\$21 million raised in a Series A round (August 2014)

This app connects sicksters with doctors who can tell them to take an Advil or hotfoot it to a clinic. And yes, HIPAA hawks, medical histories are stored in encrypted databases.





INVESTING IN THE CLOUD'S LONG BOOM

**Why cloud technology
remains a compelling, long-
term investment option**

It's hard to comprehend just how quickly cloud technology has enveloped—and arguably reinvented—the modern enterprise. What was introduced initially as a way to run software applications over the Web in the early 2000s has morphed into a \$120 billion annual IT marketplace that is upending almost every core function of business—from early offerings in data storage and sales force management to far more complex applications in talent management and retention, customer engagement, large-scale analytics, and business intelligence.

The biggest surprise of the cloud boom? We've really only seen the first act—and the cloud's next phase of evolution looks to be more far-reaching and significant than the first. It's not just the pull of mass adoption and low costs in play here. A confluence of trends reveals cloud technology to be both a critical differentiator for business in the 21st century as well as a compelling long-term investment category for individuals looking beyond this year's hottest stocks. Here's why the cloud revolution has only just begun.

Most of the global market isn't yet online. Cloud technology can only be truly ubiquitous when connectivity is available everywhere. Sixty percent of the world's population doesn't yet have basic Internet access—but the masses will be coming online rapidly over the next several years, boosting long-term demand for super-efficient, low-cost cloud services that scale globally.

Cloud technology remains the top investment priority of tech CEOs. Tech companies will see cloud-based software revenue more than double by 2018, bolstering confidence to put more capital investment into cloud platforms, apps, and IT talent. They're also flush with the cash they need—about \$564 billion today—to make those investments now.

Cloud companies are trailblazing new paths of technology innovation. Leading companies with the deepest roots in cloud technology are redesigning the rules of technology management and turning old-guard IT organizations into the core innovation centers of the so-called “app economy.” The underlying methodology driving this trend, called DevOps, is already becoming a

competitive advantage in dozens of key verticals.

The cloud will power the emerging Internet of Things. The explosion in business and consumer connectivity—the emerging Internet of Things—depends on rapid expansion and sophistication of cloud technology and platforms. By 2020, the world will have some 4 billion people using 31 billion connected devices. An entire ecosystem of IoT cloud services will be required to support all of them.

The race is on to develop effective, cloud-based security solutions. In 2014, growth in adoption of cloud security solutions for the first time outpaced growth in network security—another sign of the cloud's expanding reach in the enterprise. And, while data security remains a top concern of cloud-technology adopters and tech CEOs, a recent survey showed that nearly 30% more executives have gained confidence in the capabilities of the cloud to protect their data and intellectual property, compared to results on those same measures only two years ago. Recent high-profile security breaches will quicken the pace to close the gaps.

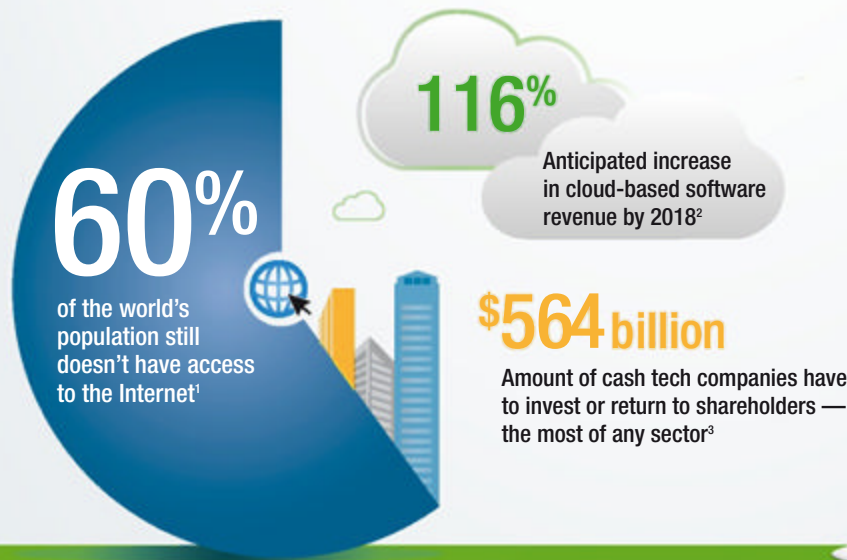
The cloud, in short, is here to stay—and in many ways remains in its infancy. Computing is shifting to the cloud in every way imaginable, for businesses and consumers, across the globe. For smart investors considering the most compelling sectors to bet on in the coming years, the cloud indeed looms large.

**For more information, visit:
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¹Telecommunication Development Sector (ITU-D), The World in 2014: ICT Facts and Figures.

²International Data Corporation (IDC), Worldwide SaaS and Cloud Software 2014–2018 Forecast (July 2014); increase is from 2014 to 2018.

³Moody's Investors Service; total U.S. is \$1.65T, technology sector \$564B. Total cash reserves for U.S. nonfinancial companies (excludes banks) through June 2014.

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PROMOTION

INTRODUCING



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MOVIE MAGIC MR. TESLA'S GLAM LAMP

MOVIE STARS have every right to be ticked off at the current state of the art in on-set lighting. Studios looking to save on utility bills often switch from hot, energy-sucking incandescent bulbs to more efficient LEDs and fluorescents. But those lights cast a muddled, unnatural glow. “If you’re in the business of making famous people look beautiful,” says cinematographer Jon Miller, “the quality of light really matters.” So for the upcoming superhero flick *Max Steel*, Miller’s company is providing a more flattering solution: plasma lighting. ¶ Originating with Nikola Tesla’s experiments in the late 1800s, plasma is a filmmaker’s dream: flicker-free and full-spectrum. The lamps used to require bulky generators, but now small transmitters like those used in cell towers can do the same job, generating radio waves that excite a capsule of noble gas and metal salts to create light. Adjusting the voltage changes the color, down for blue tones and up for a warmer look—so a single lamp can replicate the glow of sunset or the blaze of high noon. Best of all, plasma is more energy-efficient than fluorescent without the sallow-making glow. ¶ Lights from Miller’s company, Hive, have already caught on in the biz, illuminating TV shows like *The Good Wife* and movies like *Divergent*—along with red carpets at festivals like this month’s SXSW in Austin. Instead of using a hefty generator, every light will run off a single extension cord snaking from the box office window. The stars will look gorgeous, no matter who they’re wearing.

JARGON WATCH

haptic hologram

n. / 'hap-tik 'hā-lə-gram /

A tactile illusion generated by the pressure of sound waves. Floating in midair above an array of ultrasound transducers, haptic holograms can be touched and manipulated like physical objects. Possible applications range from immersive gaming to interaction with CT scans.

loopome

n. / 'lūp-ōm /

A map of the roughly 10,000 three-dimensional loops in human DNA. Because looping controls gene activation, identifying abnormalities in the loopome may help diagnose cancer and other diseases.

BPG

n. / 'bē-'pē-'jē /

Acronym for Better Portable Graphics, an image file format intended to replace the 21-year-old JPEG standard. Like JPEGs, BPGs are lossy—losing data when images are compressed—but the BPG format compresses typical files to almost half the size of comparable JPEGs.

technofossils

n. pl. / 'tek-nō-fā-səlz /

Fossilized remains of human-made technologies that may be among the last traces of our species millions of years from today. Geologists predict that the technofossil layer will include trash fossilized in landfills and whole cities covered in sediment by rising sea levels.

—JONATHAN KEATS jargon@wired.com





BEIGE

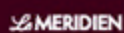
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BY MARK YARM

 THOMAS POROSTOCKY

GOING UP NEW YORK'S HIGH-RISE BOOM

This fall, the tallest all-residential building in the Western Hemisphere—the 1,396-foot luxury skyscraper 432 Park Avenue—opens in New York City. But it won't be a superlative for long: By 2018, the under-construction 111 West 57th Street will top out at 1,421 feet. These supertalls, as they're known, are among a new crop that are or will be located in midtown Manhattan, many clustered along 57th Street. Here's the skinny on the upcoming high-rises where the global superrich will soon park themselves—or at least their money.

432 PARK AVENUE

Height: 1,396 feet; it will be the tallest all-residential building in the Western Hemisphere
Architect: Rafael Viñoly, designer of the Tokyo International Forum
Highlight: A scissoring stairwell at the building's core is compactly designed for optimal residential floor area and results in the apartments' 12.5-foot ceilings.
Opens: This fall

111 WEST 57TH STREET

Height: 1,421 feet
Architect: SHoP Architects, designer of Brooklyn's Barclays Center arena
Highlight: Built on a lot just 106 feet wide, it may be the world's skinniest skyscraper—a massive steel weight will hang within the top of the building to add stability in the face of wind sway or seismic disturbance.
Opens: 2017–18

NORDSTROM TOWER

Height: 1,775 feet
Architect: Adrian Smith + Gordon Gill Architecture (it also designed Saudi Arabia's Kingdom Tower, which will become the world's tallest building upon completion in 2018)
Highlight: A cantilevered tower overshadows its (much tinier) neighbor.
Opens: 2018

ONE57

Height: 1,005 feet; the first new supertall tower open on 57th
Architect: Pritzker Prize winner Christian de Portzamparc
Highlight: The pixelated appearance of the eastern and western facades shifts depending on light exposure.
Opened: 2014

3 HUDSON BOULEVARD

Height: 1,030 feet
Architect: FXFOWLE, co-architects of the New York Times Building
Highlight: The structure rotates 22 degrees as it rises to maximize the sunlight captured by the facade's photovoltaic sunscreens.
Opens: 2018



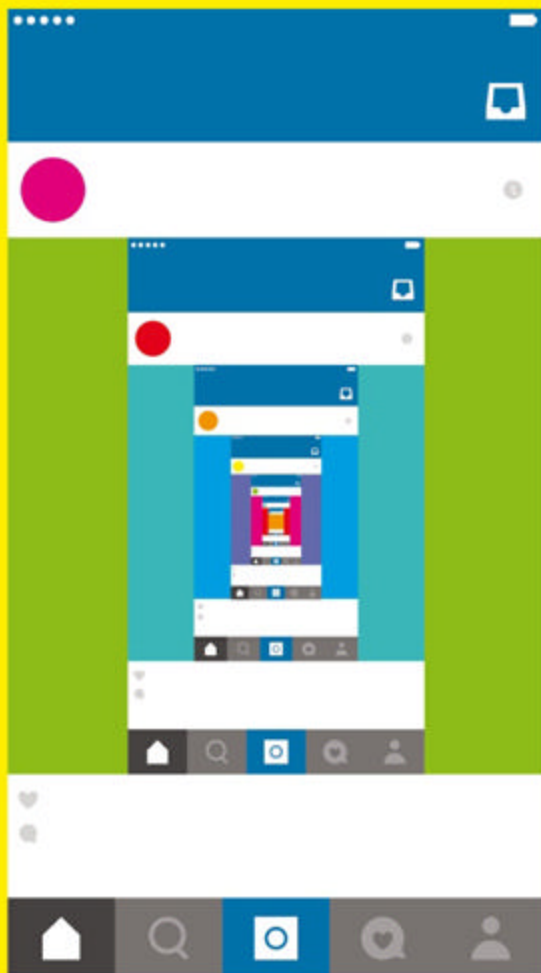
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SCREENSHOT EFFECT

DISPLAY YOUR DISPLAY

IVELINA'S BOYFRIEND stopped responding to her texts. No small trauma. She was a high school senior; they'd been together a year, and then—two weeks of nothing. Eventually he sent her a rambling excuse via SMS: He'd been longboarding, he said, and broke his phone. "u want me to send you a picture of it?" he offered. ¶ Hmm, thought Ivelina. Pretty lame. To reality-check her reaction, she applied a relatively new tool: She took a screenshot of her boyfriend's text and forwarded it to her close friends. They agreed: lame. Ivelina dumped him. ¶ Screenshots never used to be that powerful. Sharing one was largely reserved for epic videogame wins or error messages. But now people routinely take screenshots of funny/outrageous comments on social media to share with friends. Twitter users post grabs of things they're reading. College students take notes by screenshotting articles and books on their phones, tablets, and laptops. Users of Evernote on iOS save 45 percent more screenshots than a year ago, the company reports. ¶ The same thing happened with cameraphones a decade ago, when we suddenly began capturing evanescent moments from our physical

lives. Today some of our most intense experiences are online, so screenshots serve the same function. It's photography for life on the screen—"how you share point-of-view," says Joanne McNeil, a resident at the art-and-technology center Eyebeam (and a blogging colleague of mine).

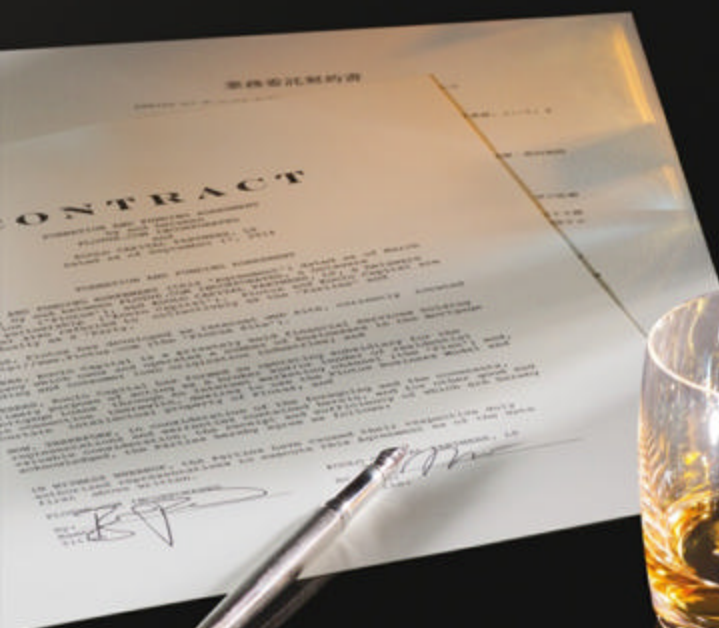
Screenshots can also be almost forensic, a way to prove to others that you're really seeing the crazy stuff you're seeing. The first viral hit of the screenshot age was the often-filthy autocorrect errors in SMS. Now screenshots hold people accountable for their terrible online words. When Australian videogame reviewer Alanah Pearce was getting harassed online, she discovered that many of her trolls were young boys. She tracked down their mothers and sent a screenshot to one (who then demanded her son handwrite a letter of apology). DC writers eagerly pounce on politicians' social media faux pas, preserving them before they can vanish down the memory hole—part justice, part gotcha.

Even more arrestingly, though, screenshots let you see other people's screenworlds, increasingly where we all do our best thinking. They invite a useful voyeurism. Venture capitalist Chris Dixon tweeted a link to an article on how "Nikola Tesla predicted the iPhone" and got 109 retweets; when he tweeted a readable screenshot of the piece, it got over 4,200. Indeed, one of the more delightful aspects of screenshot culture is how often people share text instead of just the clickbaity headline. Developers have strained for years to devise technologies for "collaborative reading." Now it's happening organically.

We're going to need better apps to help us share, sort, and make sense of this new flood. Screenshots are more semantically diverse than typical snapshots, and we already struggle to manage our photo backlog. Rita J. King, codirector of the Science House consultancy, has thousands of screenshots from her online ramblings (pictures of bacteria, charts explaining probability). Rummaging through them reminds her of ideas she's forgotten and triggers new ones. "It's like a scrapbook, or a fossil record in digital silt," King says. A lifetime of scraps, glimpsed through the screen. ■

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NUMBER OF STRUCTURES IN CHARLES YOUNG'S
PAPER CITY, AS OF FEBRUARY 1 p. 44SECONDS IN
TETRA VAAL, THE
PRECURSOR TO
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SIXTEENINTERVIEWEES WHO APPEAR IN ROBERT
KENNER'S *MERCHANTS OF DOUBT* p. 42

THE FAKE DEBATE PULLING BACK THE CURTAIN

DOCUMENTARIES HAVE FOUND new visibility in recent years, thanks to the rise of streaming services, but the same doesn't hold for the people who make them. Fortunately, Robert Kenner is an exception. For more than 30 years, the award-winning director of *Two Days in October* and *Food, Inc.* has been one of the few acknowledged masters of the form, distilling sprawling, unwieldy topics into concise, compelling films. His latest, March's *Merchants of Doubt*, pillories the "scientific experts" maintaining that cigarettes don't cause cancer or that global warming is a myth. It's an urgent cry for people to confront scientific misinformation, and it finds Kenner at the peak of his abilities.

This film at times feels like activist journalism. It seems tough to turn that into a compelling movie.

Just because you're doing something important doesn't make it a good story. You have to find how to make it interesting, find a way in and a way to surprise the audience. All these things really come up when you're doing an activist, survey kind of film. They're hard movies to make—why do people care?

This one feels particularly complex.

The hardest thing to convey in a movie is information. You remember characters, you remember emotions, you remember comedy, but information just goes in one ear



and out the other. *Merchants* was a really hard film because it's ultimately about being deceived. We're seeing a small group of people that has been very successful in stopping us from believing that cigarettes cause cancer, successful at getting people to put poisonous chemicals in couches. This small group was out to stop inconvenient science—science that got in the way of selling a product. Now they've latched onto energy and climate.

So are journalists still being “fair,” in some sense, when they talk to these people or their proxies?

In terms of the science, are you going to go find people that say the world is flat? I don't think it's your obligation to cover that the world is flat. There is no question. When there's no question, you don't go find the other side.

And you wanted to get to the real science in *Merchants*?

No, it's about the deception. How we're being deceived into thinking there are two sides. The film isn't about climate science itself; I don't have anything to add to that, other than reminding people of the consequences. It's really that things are being discussed by a small but effective group of people. Only a handful of them actually have degrees in climate science, yet they've managed to make this look like a real debate. A lot of other people also deny the science, but they're not climate scientists.

Do you think this movie is going to change anyone's mind?

I would like to change people in the middle who aren't sure, but I'm also anxious to reach people who already believe this. People ask, “Are you preaching to the choir?” I say, “No, but we're preaching to the congregation. The people that are here once a month, that I'd like to be part of the choir.” With civil rights we didn't get Bull Connor to say, “You should change your mind”—we made it morally unacceptable to do what he was doing. It should be unacceptable that these people are putting the planet in peril. **W**




ULTRA

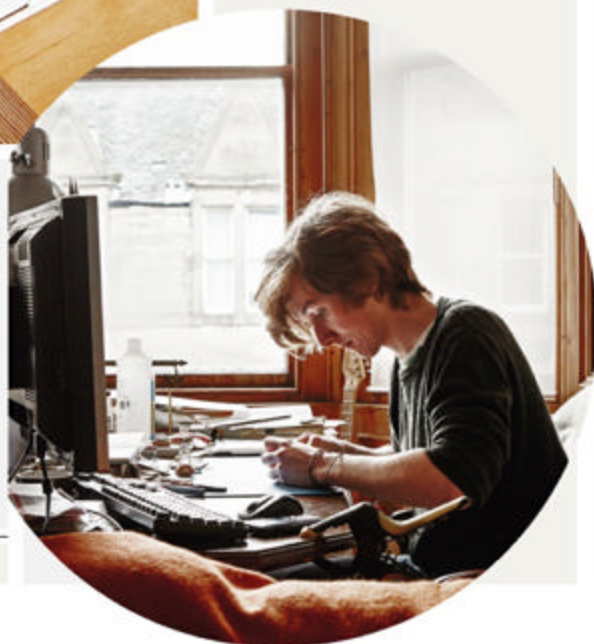
MAR 2015

044

WHEN CHARLES YOUNG decides to build a cabin, it takes him ... less than an hour. That's because instead of logs or lumber, Young uses paper and glue. After getting his master's in architecture from Edinburgh College of Art last year, Young has spent part of every day expanding his paper city, one tiny edifice at a time. He calls it Paperholm, and it's full of whimsical buildings: tree houses, sky towers, windmills. One of the structures is based on a real Norwegian church, while Russian fairy tales inspired his chicken-legged huts (evil witch Baba Yaga lurks therein). Once he settles on a rough plan, usually first thing in the morning, Young gets cutting. "It's the way that I think through ideas—by developing a model and improvising," he says. He uses watercolor paper, PVA glue, dressmaking pins, tweezers, and a surgical scalpel (unsterilized), and construction is finished by lunch. It helps that the models are so bitsy; Young once made a bus just half an inch long. Heavy breathing could send his paper walls (and roofs and staircases) flying around his apartment, but Young hasn't damaged a structure yet. His growing empire is nothing to sneeze at. Or on.

SUPER CUTS AN EXTRA TINY PAPER CITY

BY JASON KEHE |  CHRISTOFFER RUODQUIST





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Twin Shadow's strong '80s vibe never overshadows his 21st-century creativity.

THE SYNTH LORD A NEW POP PRINCE

WHEN GEORGE LEWIS JR., aka Twin Shadow, announced he was signing with Warner Bros. Records last fall, he half-joked about grabbing coffee with his new label-mate Prince. They'd have plenty to talk about: Like Prince, Lewis is a talented multi-instrumentalist (guitar/keyboard/drums) with a bold artistic vision. (Also like Prince, he's a sexy motherfucker; both of Twin Shadow's two acclaimed indie albums prominently feature his striking mug staring soulfully into the camera.) His major-label debut, *Eclipse*, is out in March and boasts the most vital work of the 31-year-old singer-songwriter's career. Recorded in part at a converted chapel in LA's Hollywood Forever Cemetery, it continues the strong synth-pop vibe of his previous efforts without descending into throwback New Wave mimicry. Much of that stems from Lewis' own sense of ambiguity. "I've always felt alien and everyman at the same time," says the Dominican-born, Florida-raised, Los Angeles-based (we're done, we promise) musician. "I'm not rock and roll, I'm not hip hop, I'm not R & B." That in-between-ness makes for a singular sound, one that lets him experiment with genres at will. It's also allowed him to remix everyone from Sky Ferreira to N.E.R.D. His mad science is on full display on the album's recombinant second single, the melancholy but assured "Turn Me Up." The power-ballad reverb wouldn't be out of place in a *Top Gun* montage, but Lewis' hybridizing touch makes it unmistakably the sound of a new millennium—or, to stick with the Prince theme, of a new power generation. —MARK YARM

 JASON NOCITO



I'VE MET MY MATCH!

SOMEHOW, only one thing about robot movie *CHAPPIE* makes me furious: Who decided on that capitalization style? LiveJournal users from 2004? Other than that, everything about Neill Blomkamp's new flick is exactly what we need to get robot-human relations back on track. The titular droid is made of recycled parts and is thus about 14 Rotten Tomatoes points more relatable than the ones in Will Smith's *I, Robot*. (Asimov's Eighth Law: Robots shall not ape the design of first-gen iMacs.) But the aesthetic pales next to the political: *CHAPPIE* won't be hoodwinked or bamboozled by Hollywood's organopatriarchy! His intelligence is innate, not conferred by a magical lightning strike like that hack Johnny Five. He's not a comic-relief servant like R2-D2, *Space Camp*'s Jinx, or V.I.N.CENT from *The Black Hole*. And he's not a hardwired hypermenace like ED-209, Gort, or *The Black Hole*'s Maximilian. Instead, he's an innocent in the mold of icons like the Iron Giant or WALL-E—a steel Pinocchio who gradually learns about the evil that men do (like making *The Black Hole*). Yes, I'm concerned that *CHAPPIE* learns to be human from gooney-bird South African rap group Die Antwoord; that's like learning to write a satisfying third act from M. Night Shyamalan. But overall I'm charmed. Looks like I'll have to find a different cinematic target for my keen and exact—why, hello there, *Paranormal Activity: The Ghost Dimension*! You got here just in time!



For more Angry Nerd, go to
VIDEO.WIRED.COM.



76 THE ANNUAL AVERAGE DAILY TEMPERATURE IN DEGREES FAHRENHEIT // 57.7 PERCENTAGE OF THE POPULATION THAT'S FOREIGN-BORN (COMPARED TO 19.4 PERCENT FOR FLORIDA OVERALL) // 800-PLUS BUILDINGS IN MIAMI BEACH'S ART DECO DISTRICT // 6 BARSTOOLS AT THE UNDERWATER "DIVE" BAR SUNK JUST OUTSIDE THE CITY // 3 CHAMPIONSHIPS WON BY THE MIAMI HEAT // 1 CHAMPIONSHIP WON BY THE MIAMI HEAT WITHOUT LEBRON JAMES

E-RACERS, TIGERS, AND RAVES BEYOND THE BEACH IN MIAMI



WANDER THROUGH THE WYNWOOD WALLS, WHERE NEW STREET ARTISTS COVER BUILDINGS WITH BRIGHTLY COLORED GRAFFITI.

HOME TO CELEBRITIES, rappers, musicians, and Al Capone's hideaway, Miami is best known for ... a really good time. But the once and future marshland is more than the sum of its parties. With crystal waters, white beaches, and a consistent tropical heat, it's a natural escape from winter blues. Plus, in March, America's sunporch hosts the US' first Formula E car race (all-electric FI!) and the annual Miami International Film Festival. And partyers will swarm in for one of the largest electronic-music festivals of the year, Ultra. (Yeah, there's a lot to do.) Whether you fly south for the race, the films, or the rave—or skip them altogether—a Cuban sandwich is worth the trip. —JULIA GREENBERG

SEE

Avoid the South Beach crowds and head instead to **Bill Baggs Cape Florida State Park** on Key Biscayne. Lounge on the mile-long sandy stretch or rent a bike to explore the secluded park. Pro tip: Keep your eyes peeled for manatees. Then check out **Roy Lichtenstein's** public *Mermaid* sculpture before indulging your



inner design geek in the Design District. Airboat tours zip you through the nearby **Everglades** to see turtles, birds, and giant gators. (Pack earplugs; the boats are insanely loud.)

DO

Swim in the historic spring-water **Venetian Pool**, reopening in March, and check out its caves and waterfalls. Feeling adventurous? Head south to **Jules' Undersea Lodge**, one



of the world's rare underwater hotels. Play with a tiger cub and snuggle a baby gibbon on a tour at the **Zoological Wildlife Foundation**—your Instagram will thank you.

EAT

For old-school Cuban sandwiches and empanadas, head to the classic **Versailles**

Restaurant near Little Havana. But for new Cuban-inspired gourmet, try **Bread+Butter**. After a day at the beach, skip the fancy restaurant and stop at **Joe's Take Away** for stone crab legs and a key lime pie. For hand-crafted cocktails, head to **The Broken Shaker**—pick your poison or stick with their basics, like the kale-and-pineapple caipirinha.



"Miami is a melting pot—and a hot one at that. My favorite music venue is Bardot, where the cool young up-and-comers play. Another low-key place with great music is Radio Bar. It's a nice mix of artists, suits, locals."

—Genesis Rodriguez, actress, voice of Honey Lemon in **Big Hero 6**, and Miami native

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PLASTIC SHIELD

A polycarbonate layer insulates the fiber optics from static electricity.

STEEL WIRE

An armor of wire protects the cable from thousands of pounds of water pressure. It also makes the cable strong enough to hang from the ship to the seafloor without breaking while it's being laid.

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ALUMINUM BARRIER

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GEL FILLING

An aluminum, copper, or steel tube surrounds the optic fibers, suspended in an airtight and water-insoluble fluid like petroleum jelly. It's the last stand against seawater reaching the glass strands if the outer layers crack.



THE BRAZILIAN SEA-SPANNER

DANGERED BY Edward Snowden's revelations on the wiretapping habits of tri-lettered American agencies, Brazil is taking the Internet into its own hands—and giving Uncle Sam the middle finger. Right now most Internet traffic between South America and Europe travels through the overly inquisitive US, but that's about to change. Next year, Brazil's Telebrás and Spain's IslaLink will begin laying \$185 million worth of undersea Internet cable to span the 3,500 miles of Atlantic Ocean between Fortaleza, Brazil, and Lisbon, Portugal. The Americans can just follow their allies' activities on Facebook like everyone else.



CARS

Postrace, mechanics dismantle each multimillion-dollar car. The gearbox, wings, mirrors, suspension, and even the chassis each go into custom-made cases. Painted parts get packed in foam—no one wants to (*gasp!*) scuff a sponsor's logo.

TIRES

F1 is murder on rubber. About 2,000 tires are on hand for each race, including special types for wet or slick conditions.

GARAGE

Teams typically have three to five sets of common parts, workbenches, tools, and other gear, which they send by sea to upcoming race locations weeks in advance.

FLUIDS

Each race requires 2,500 liters of fuel, shipped in fireproof canisters. Also: 140 liters of engine oil, 40 liters of gear oil, and 90 liters of coolant.

FOOD

F1 crews like to be self-sufficient, bringing their own chefs and cooking equipment, along with enough grub and place settings for more than 100 staff, sponsors, and guests per team.

ZOOM ZOOM THE WILD F1 RACE TO THE STARTING LINE

FORMULA 1 is grueling—drivers can pull up to 3.5 g's during races that last more than an hour and a half. Arguably, the logistics of moving an F1 team between races are even tougher. Kicking off in March, the 2015 season will include 20 events—more than ever—across 20 countries and five continents. The turnaround from one race to the next can be as short as a week, and that means two cars and up to 40 tons of gear per team need to be at the next track, no matter how far away it is, about 48 hours after the checkered flag. The endeavor is enough to fill an 80-page checklist and six 747s, and it keeps an army of people on the road for as many as 200 days a year. In fact, logistics outfit DHL has a whole team dedicated just to F1 shipping. “You can’t stop what you’re doing because of the weather,” says Alan Field, Team McLaren’s track-side support manager. “You’ve just got to crack on.” No pit stops allowed.





Illumina HiSeq X

BASES SEQUENCED PER DOLLAR: 3,750,000

Illumina's machines can resolve a person's full genome for under \$1,000—an appealing combination for researchers who are combining our DNA for genes associated with various traits. The company is also the go-to choice of personal-genome companies like Gentle. The HiSeq X works by unzipping DNA helices and rebuilding one side with fluorescent-tagged bases that a special camera can see and count. It takes about three days to run a sequence. Not the fastest approach, but it's accurate—just one error per 1,000 bases.

Thermo Fisher Ion Proton

BASES SEQUENCED PER DOLLAR: 75,000

Doctors and genetic counselors looking for specific information—about a particular disease-causing mutation, say—don't always need the entire genome. The exome, which is the 1 percent of the genome that encodes proteins, is enough. The Proton works with pH instead of light: When two complementary bases stick together, they throw off hydrogen ions, which register as a tiny increase in acidity. It's less accurate, with one error every 500 bases, but an exome takes less than a day and costs just \$400. A panel of specific genes is even faster.

A/B TEST GENE SEQUENCING

GENETIC DATA has gone the way of fast food: It's cheap, speedy, and widely available. And that's a good thing, because the sequence of bases—the As, Cs, Gs, and Ts that comprise DNA—contains a lot of information. Doctors can use that sequence to track changes in cancer cells as they mutate, researchers can use it to discover new disease-associated genes, and nonscientists can use it to divine their medical destiny. Next-gen sequencing machines make all that possible—and they use a couple of different technologies to get it right.





said, 'Jews.' And I said, 'What?'" The colleague suggested they watch the door, size up everyone who walked into the bar, and write down whether each person looked Jewish. Shapiro agreed. They did this for a while and, in the end, found they agreed 90 percent of the time. They'd cleared the 75 Percent Rule for Jewishness—handily! And yet, it was just a bunch of worthless opinion. It had no bearing on any objective reality—i.e., whether any of those people actually *were* Jewish. That's the danger of taxonomy: If you're not careful, you can wind up layering your own subjective perception over the inscrutable fluidity of nature and mistaking it for fact.

I think your Lego idea is brilliant, because it transforms the chore of cleaning up Legos into more time *playing* with Legos: The child isn't just putting the Legos away, she is still *building* something with them—filing them away into a particular order. But I also think your Lego idea is awful, because it's *your* order. By demanding your child color-code the Legos, you're layering your vision of perfection onto an array of Lego beauty that, in reality, could be classified and organized in any number of equally wonderful ways. By shape! By size! Built into cubes, then conjoined into a big old rectangle!

So why not let your kid decide? Let her dictate the system. Let there be a different system every time. That will generate excitement about cleaning up, instead of resentment. And excitement is the key to cleanup time, if not to life itself. As the great second-century rabbi Pinhas ben Yair once said: "Zeal leads to cleanliness, cleanliness to purity, purity to separation from worldliness, separation to holiness, holiness to humility ..." ■

MR. KNOW-IT-ALL BRICKS AND ORDER

Should I enforce a taxonomy for Lego cleanup? I'd like to make my daughter sort all the bricks by color.

ARTHUR SHAPIRO is a 69-year-old man with a robust beard and leathery skin—the legacy of a lifetime out in the sun, chasing butterflies with a net. Shapiro is one of the world's most respected and seasoned lepidopterists, and once, over breakfast at The Posh Bagel in Davis, California, he explained to me how meaningless taxonomies can be, even when they seem authoritative and rational.

Take butterfly subspecies, for example. For a long time, he told me, the decision to designate a new subspecies of butterfly in the scientific literature hinged on the so-called 75 Percent Rule. It was a rule of thumb: To be accepted, a proposed new subspecies had to look distinct enough that experts could eyeball specimens and agree 75 percent of the time that those butterflies met the physical description of the new subspecies. The rule sounded reasonable to me—until Shapiro told me a story that exposed its mushiness.

Once, Shapiro said, he was sitting in a bar with a colleague when the colleague proposed an experiment: "He



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WHAT'S INSIDE LASER PRINTER TONER

POLYESTER

Toner is mostly powdered plastic. That means it can hold a static charge—and like socks in a dryer, it'll cling to anything with an opposite charge. Laser printers use that cling to move the toner around: first onto an imaging drum and then onto the paper. Hot fuser rolls then smoosh the stuff into the paper fibers.

WAX

Early printers used radiant heat to melt the toner; unfortunately, the boss's memos sometimes caught on fire. Fuser rolls fixed that, but toner tended to stick to them. The solution? Add wax to the mix for lubrication.

CARBON BLACK

To make the clear polyester look black, manufacturers commonly use this grimy stuff. It's a jumble of pure carbon particles beneath floating clouds of shared electrons. Because these electrons have lots of room to move, they absorb light energy at all visible wavelengths. The result: No light reflects back to your retina, an absence your brain calls "black."

FUMED SILICA

Microscopic glass beads (SiO_2) provide an almost liquid powder flow. Fun project: Make your own by vaporizing sand in a 3,000-degree-Celsius electric arc.



YELLOW 180

Along with black, color printers have yellow, magenta, and cyan cartridges. They can combine to make any other hue. All organic pigments have alternating single and double bonds that cause their electrons to absorb specific wavelengths of light. This one traps violet light while yellow passes through, bouncing off the page and into your eyeballs.

RED 122

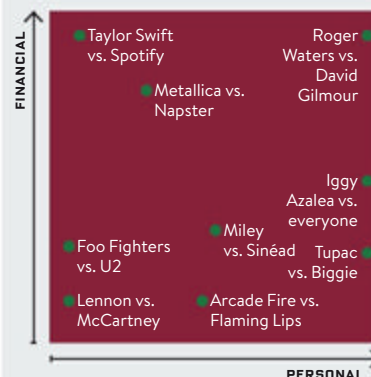
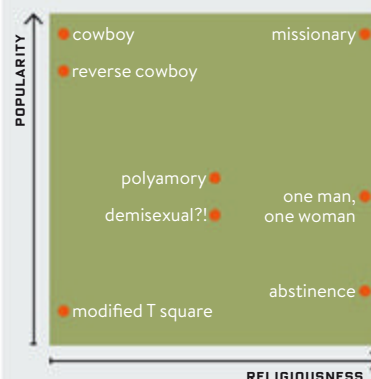
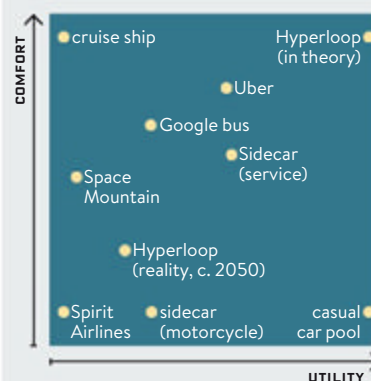
Compounds of quinacridone produce intense reddish hues. In Red 122 (2,9-dimethyl-quinacridone), the flat molecules stack up like dinner plates in a crystal structure that shifts the reflected color to magenta.

BLUE 15:3

Copper phthalocyanine produces cyan, midway between green and blue. This pigment could someday power quantum computers because its electrons can exist in a state of superposition.

CHARGE CONTROL AGENTS

The powder picks up static as it leaves the cartridge, and bits of iron, chromium, or zinc help boost the charge. Handle cartridges with care: Friction amps up static electricity, so sucking up spills with a regular vacuum cleaner can cause a colorful explosion.

**CHARTGEIST****Music Feuds****Sexual Positions****Rideshares**



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URBAN OUTRIGGER

The Russian motorcycle czars at Ural—who've been making sidecar bikes since World War II—specifically designed the new cT to be the ultimate city ride. They succeeded: It's small and maneuverable, with legit-comfy seating for two and a 2.9-cubic-foot trunk to stow your groceries. It fits into parking spots a Smart car wouldn't dare, zips adeptly through traffic, and costs less than a Scion. Unlike many sidecar rigs, the cT's third wheel isn't powered—making this one-wheel-drive model great for back roads and snow. All three of its wheels do have brakes, though, and there's a reverse gear for Wes Anderson-style vehicular double takes (or parking). Recommended but not included: helmet, scarf, and old-timey goggles.

BY JOE BROWN

PEDEN + MUNK



1 | **SENNHEISER
MOMENTUM
IN-EAR**

BEST FOR: Bassheads looking to add some extra wallop to those wubs

It defies logic that something so small can pump out such massive bass. But these in-ears from Sennheiser deliver serious low-end oomph and are the ideal pick for bass-driven genres like dubstep or hip hop. They're tuned to be bratty, so they lack some sonic nuance, but they more than make up for it with conveniences like a flat, tangle-resistant cord and an in-line three-button remote with a mic.

\$100

2 | **BOWERS & WILKINS
C5, SERIES 2**

BEST FOR: Anyone with an oddly shaped auditory meatus who craves a neutral sound

This update to B&W's acclaimed C5 earphones includes the same ingenious design as the original: a cable-looping system and tungsten weights that keep them anchored inside your concha and angled toward your acoustic canal. The biggest difference in this year's model is one you'll hear, not see. The redesigned 9.2-mm drivers produce a more natural, open sound that'll accommodate everything from gypsy swing to vegan hardcore.

\$180

HEAD-TO-HEAD | **EARPHONES**

SOCKET TO THEM

Head-eclipsing cans are fine for sedentary listening sessions. But when your music needs to be mobile, the best prescription is a quality pair of ear pills.

BY BRYAN GARDINER

PHOTOGRAPHY BY PEDEN + MUNK

BENCHMARK

RAY-BAN WAYFARERS

TECH SPECS

With 80-year-old glare-cutting science and 60-year-old hipster-cool chic, these iconic sunglasses have ridden the waves of fashion in timeless style.

\$155 AND UP

The times, they may have changed. But the Wayfarers' design is still beloved—and widely imitated.



WAYFARERS WERE NOT the debut model in Bausch & Lomb's Ray-Ban line, but they're certainly the most famous. The shades that popularized antiglare eyewear were the company's Aviators, originally developed in the '30s for the Army Air Corps. They were as rationally designed as a B-17 bomber—the teardrop-shaped lenses shielded the full range of human vision. In contrast, the Wayfarers' flared trapezoidal shape of 1952 was a design flourish akin to the Cadillac tail fin. Though the new green glass lenses were just as high tech—blocking 85 percent of sunlight without noticeable color distortion—these were among the first sunglasses made for both seeing and being seen. And the people seen in them? Everyone from Muhammad Ali to Marilyn Monroe. Even people who *weren't* wearing Wayfarers often are remembered as if they were, like Audrey Hepburn in *Breakfast at Tiffany's*. (Hers? Likely Oliver Goldsmith look-alikes.) Wayfarers are still widely imitated, their geometry copied by labels like Marc Jacobs and Forever 21. Seems kind of shady.

BY JONATHAN KEATS | PEDEN + MUNK



SPLIT SCREEN

PUZZLE HEAD

MIND GAMES

Life's a cakewalk for a genius like you. Challenge your gray matter with these brain-racking puzzles.

BY TIM MOYNIHAN

PHOTO BY PEDEN + MUNK



iOS | ANDROID

WORDS

PUZZLEJUICE This deceptively complex app combines aspects of word-search puzzles with everyone's favorite falling-block game, *Tetris*. The resulting twofor is difficult and incredibly addictive. **\$2**

BONZA Part word search, part jigsaw puzzle, and part trivia quiz, *Bonza* gives you a few word fragments and a theme. Your task: Reconstruct the pieces to spell words that match the theme. **FREE**

NUMBERS

BICOLOR The graphics are simple. The goal only seems that way: Move each tile a designated number of spaces to turn the screen a single color. Slide puzzle + *Minesweeper* = your next habit. **\$1**

QUENTO This elegant math game asks you to arrive at a specific number by adding and subtracting numbers on adjacent tiles. Arithmetic hasn't been this challenging since fourth grade. **FREE**

DRAWING

TRAINYARD EXPRESS Sketch tracks to lead each train into its color-matched station. Attempt to not lose your mind as the trains change colors. You get over 60 levels gratis; \$1 buys you 150 more. **FREE**

BLEK Squiggle a gesture with your finger, then watch it animate and repeat. If you drew it correctly, it'll hit all the colored dots on the screen. If not, you'll yell something more R-rated than "Blek!" **\$3**

ADVENTURES

THE HEIST This is several brain twisters in one—three sliding puzzles and a Sudoku-like game played with symbols instead of numbers—all presented through the prism of a safecracking job. **\$1**

MONUMENT VALLEY The levels in this 3-D game are impossible—literally. Their Escherian design requires decoding visual perspective tricks to advance. Gameplay is short but beautiful. **\$4**

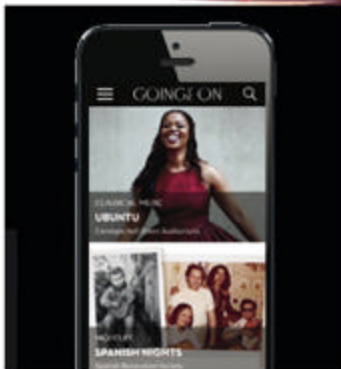
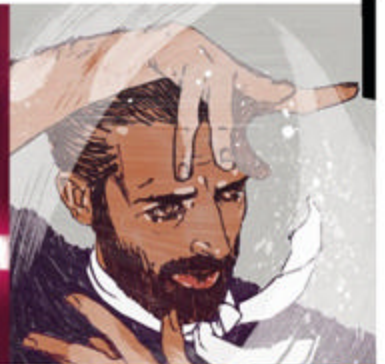


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JOE BROWN

TAVIS COBURN

ALONE TOGETHER

Working from home doesn't have to rob you of all human contact.

YOU'VE SEEN IT in spam comments on the web, on flyers taped to utility poles, shouted at you from your inbox and late-night TV: *Work from home, earn thousands of dollars a week!* Ha ha, who would ever fall for ... actually, maybe that spam is onto something. After all, who *doesn't* know someone who works from home? My wife and I moved to San Francisco from New York a year ago, and she still works for the same firm—East Coast hours, meetings via webcam, the whole deal. Our upstairs neighbor is doing pretty much the same thing. ¶ It's easy to dismiss these two cases as fringe on the carpet of labor, but they're not: According to Global Workplace Analytics (they analyze workplaces globally), 2.6 percent of Americans work remotely more than half the time. That's 3.3 million people—more than live in Chicago—and a *lot* of jokes about the [insert neighborhood] satellite office. ¶ But this is just rich folks with fancy degrees, fancy computers, and enterprise-grade broadband, right? Nope. Many remote jobs are accessible to people without a college education. You can use your household data pipe to work in a virtual call center, take airline reservations, help people get health insurance, and more. Some of those email come-ons, it turns out, can lead to employment. Which raises a question: How are these millions of people not totally insane?

Sometimes when I get home from work, it's like my wife has been stranded on an island and I'm the first human she's seen in years. (Sorry, honey, for crossing the work/home divide. :D) She is not alone in feeling alone. According to GWA, 15 percent of remote workers express feelings of isolation without an office to call not-home. That's serious solitude.

These crazy-making effects are something Jason Fried has put a lot of thought into. Fried is a cofounder of Basecamp. Since 1999, people have used its collaboration software to work from cafés, beaches, and parents' basements across the globe. And, walking the walk, 45-person Basecamp boasts employees in 30 cities worldwide. It does have an office, but not entirely for the reason you'd expect.

There are only 13 employees in Chicago, where that office is located, but they all work from home frequently. Fried says its most important function is as a hub for a twice-a-year meetup: "We call it the Meetup. I know, kind of an unoriginal name." The name might not be a revelation, but the event itself is forward-thinking: Basecamp flies everyone to Chicago, puts them up in a hotel for a week, and encourages them to hang out.

But it isn't just a party; it's about creating corporate culture across so many miles. "Communication is often really subtle," Fried says. "When you see a chat or an email, being able to picture someone helps you connect the dots." Face-to-face contact reveals non-verbal cues that office workers take for granted. Basecamp also encourages staff to form ad hoc meetups. By "encourages," I mean pays for.

Fried: "The support team got a house some weekend, and we paid for it."

Me: "Wait, you paid for it?"

Fried: "Yes."

Me [to self]: "Sheeeet."

Fried also tries to nurture relationships in less spendy ways. He instituted a monthly Google Hangout where he and cofounder David Hansson discuss anything non-work-related with randomly selected employees. "It's a fun way to force spontaneity," Fried says, charmingly unaware of, or unwilling to admit, the contradiction.

This kind of thinking is exactly what will make remote working more viable for more people, and that's a good goal. Working from home can be a real positive. It can save you money, let you spend more time with your kids, and even provide your spouse a sanity-saving dose of human contact. ■

Email joe@WIRED.com.



^{*}vs. a regular manual toothbrush



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A man in a dark pinstripe suit and a colorful patterned tie is smiling and looking off-camera. He is holding a silver beer tap handle with the 'Coors Light' logo. The background is a teal wall with a pattern of small white dots.

SAM WALKER

Global Chief People & Legal Officer, Molson Coors

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SEX FOR Sale

OR PAGE 100



THE TRAGIC TALE OF THE SITE THAT JOHNS LOVED AND SEX WORKERS COULDN'T LIVE WITHOUT.

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THE SEXY PICS THAT GOT PHOTOGRAPHERS KICKED OFF INSTAGRAM.

TURN TO PAGE 80



FEATURING CENSORED ARTISTS

John Arsenault, Lula Hyers, Alexandra Marzella, Gianni Leo Falcon, Magdalena Wosinska, Blaise Cepils

OH COME NOW



Sex TOYS LIKE YOU'VE NEVER SEEN THEM

FULLY REVEALED ON PAGE 96

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There will be no kissing, no fondling, no Saturday morning walk of shame: Rae is an aromantic asexual, Sean considers himself a heteroromantic demisexual, and Genevieve identifies as a panromantic gray-asexual. "I can flop all over people and nobody expects me to want to sleep with them or date them. It's great!"

RATED G ON PAGE NO. 74

HEY FOLKS! LET IT ALL



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WHEN PORN COMES TO

LIFE



FLIP TO PAGE 90

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Number 23.03

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TURN TO PAGE 72

HOW TO

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YOU WON'T BELIEVE YOUR eyes



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TURN TO PAGE 78

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BEST. *Sex*. EVER.



TECHNOLOGY SEEMS SO COLD. Circuits, processors, glass. The idea of mixing tech and sex can seem equally chilly: complicated devices, teledildonics, porn (so much porn). But that's all wrong. Technology is changing everything about our sex lives, but there is nothing cold about it. ¶ However visceral, animalistic, or fleeting, sex is, at its core, about human connection. And we now live in the most connected age in history. ¶ Getting it on is different today. How we find partners, how we learn what excites us, how we flirt, how we make dates, how we grow closer, how we turn each other on—all of it has changed. Some of these changes are subtle. Consider the rush of sending a racy message, compounded by watching those dots as you await the response. It's a modern-day swoon. Other changes are profound: With the tools on your smartphone right now you can likely get laid in the next hour. Whether you're hooking up, hanging out, happy alone, or hitched, today you use technology to do it. ¶ Sexuality is as personal and subjective as anything about us. And so there are dating sites and apps for finding a religious match, chatting with a stranger, sharing an experience, and cuddling. There are online communities for every orientation. There are sites for every fetish, sex toys for every taste and anatomy, and yes, there is porn for every predilection. The web has flattened the world—enabling even the most isolated individual to find others who share their specific interests and desires. In many ways it has made us all both voyeurs and exhibitionists in our own personal sexual landscape. ¶ And there's something resolutely neutral about the technology now fueling our lust: It is taboo-agnostic. You can use it to cheat on someone as easily as you can to romance them. It's nonjudgmental. You can visit a site to pay for sex or to connect with people who choose to abstain from it. Whether you're using a vibrator alone in your room, swiping right and meeting up, or Skyping with a distant lover, technology is there for you. It will not disapprove or scold. It will only enable. Our “cold” technologies have turned up the heat. ¶ And so this issue of WIRED brings you 40 pages of stories about love and sex in the digital age. This is how we do it today. Get ready to plug in, turn on, and get off. —CAITLIN ROPER





MY STORY

DIRTY

Skyping

0 7 3

◆ I have long been a purveyor of private email filth. It's a natural extension of the age that dawned during my college days, when people started writing email all the time about everything; of course messages to people I had sex with might include sexy content. I did think about hacking, but the worst-case scenario didn't seem that bad: Someone would find out

I write pretty good email filth.

But I never took or sent pictures. I pledged an even more adamant *hell no* when it came to video. So when a meandering video-chat at an early point in

a relationship in 2011 turned heavily suggestive, I had my concerns.

The connection wasn't secure. I wouldn't know how to get a secure one, and let's be clear, I have no idea what

that even means. But my boyfriend lived in France, and though we'd met in person only three times, we were already in love, goddammit. Without video, we wouldn't have seen each other for months at a stretch. We became a couple over video. Video was our relationship. As our relationship didn't exist without video, neither would our sex life.

So there we were, that first time,

wearing clothes—and then not. And then there we were on the regular, all our pieces and parts, our looks and sounds and moves, on display. Until one day, mid-act, the screen froze. I froze too. “What was that?” I asked, my heart racing (faster). “Did your screen freeze too? What was that clicking?” We paused, vulnerable. We discussed possibilities. Could someone be ... tapping in?

Ultimately we continued on like nobody was watching. As with dancing, it's really the only way to have Skype sex.

I still wonder sometimes whether an Estonian software engineer or NSA agent somewhere has a recording. If it ever got out, it would be an unspeakable defilement. I would start throwing up and never stop. But love is about taking chances. Currently those include a chance that I may someday have to run away to a country with less puritanism and worse Internet access. But we did it because the pros outweighed the (possibly imaginary) cons. If I ever have to go into Internet exile, I will know that intimacy-enabling technology got me a dream husband who'll come along. —MAC MCCLELLAND

NEXT
DEMISEXUALS



LET'S

NOT

DO IT

MEET THE ATTRACTIVE,
SMART, SELF-AWARE YOUNG
PEOPLE WHO JUST
AREN'T THAT INTERESTED
IN SEX.

BY KAT MCGOWAN


JAMES DAY

0 7 5

It's Friday afternoon during finals week, and two undergrads at the University of Tennessee in Knoxville are lounging together on a battered couch in the student center, watching cartoons. They've only met twice before, but they're all over each other. Rae, a tiny pixie of a sophomore wearing a newsboy cap, nuzzles up against Sean, a handsome freshman. He's got his arm draped across her. They giggle and tease each other, and she sprawls into his lap. Their friend Genevieve, perched on the arm of the couch, smiles and rolls her eyes. ¶ It looks like a standard collegiate prelude to a one-night stand. But there will be no kissing, no fondling, and definitely no Saturday morning walk of shame. Sean and Rae do not have the hots for each other—or anyone else, for that matter. In fact, they're here hanging out at the campus outreach center, a haven for all who question their sexuality and gender identity, because they're exploring an unconventional idea: life without sex. Or mostly without sex. They're pioneers of an emerging sexual identity, one with its own nomenclature and subcategories of romance and desire, all revolving around the novel concept that having little to no interest in sex is itself a valid sexual orientation. Rae tells me she's an aromantic asexual, Sean identifies as a heteroromantic demisexual, and Genevieve sees herself as a panromantic gray-asexual. ¶ Not sure what these terms mean? You're not alone. The definitions are still in flux, but most people who describe themselves as demisexual say they only rarely feel desire, and only in the context of a close relationship. Gray-asexuals (or gray-aces) roam the gray area between absolute asexuality and a more typical level of interest. Then there are the host of qualifiers that describe how much romantic attraction you might feel toward other people: Genevieve says she could theoretically develop a nonsexual crush on just about any type of person, so she is "panromantic"; Sean is drawn to women, so he calls himself "heteroromantic." ¶ If the taxonomy seems loose and even confusing, it's because the terms were created almost wholly online, arising on gaming-site forums and a nest of interrelated Tumblrs, blogs, and subreddits. They don't necessarily describe fixed identities but serve more as beacons for people to locate each other online. While the rest of the world was using the web to invent and gratify new pervy thrills, these people used it as a wormhole out of a relentlessly sexual culture. It might be the only corner of the Internet that is not laced with porn. ¶ So although labels are a big part of it, demisexuals and gray-aces don't get too caught up in the lingo. They tend to be pretty comfortable with the idea they might change. A few months after that Friday at the outreach center, Genevieve realized she is more of an asexual than a gray-ace, and Sean now isn't sure if he's demi or ace. "Every single asexual I've met embraces fluidity—I might be gray or asexual or demisexual," says Claudia, a 24-year-old student from Las Vegas. "Us aces are like: whatevs." ¶ Friends

and family often find such identities flat-out strange and assume that it's all some kind of postadolescent phase or that something is seriously wrong. They might wonder if it's really just a stop on the way to homosexuality or maybe the result of trauma or a hormone imbalance. But to those who embrace this approach to sex, it's just how they are. Sex is "fascinating from a clinical point of view, but personally? No," Rae says. "I have better things to do with my time."

The conventional wisdom today is that lust and gratification are natural and healthy, a nonnegotiable aspect of being human. We

presume that freedom of sexuality is a fundamental human right. But the idea of freedom *from* sexuality is still radical. It is an all-new front of the sexual revolution.

ASEXUALITY HAS

SLOWLY BEEN coming out of the closet for more than a decade. In 2001, a Wesleyan University student named David Jay created a website called the Asexual Visibility and Education Network. It started as a repository of informa-

tion about all things asexual. When forums were added a year later, members started trickling in. By 2004 there were a thousand. Today there are some 80,000 registered users.

But for some people, the idea of being completely and entirely asexual still didn't quite fit. The word *demisexual* seems to have come into being on an AVEN forum on February 8, 2006. It was coined by somebody who was trying to explain what it was like to be mostly, but not entirely, asexual. The term caught on only in the last few years, and now most people who are demisexual say their desire arises rarely and only from a deep emotional connection. For a demisexual, there is no moment of glimpsing a stranger across the room and being hit with a wave of lust. "I've only ever been sexually attracted to three people in my whole life," wrote one self-described demisexual, Olivia, a few years ago. "My partner is sexually attracted to that many people during particularly sexy bus rides."

Beyond that, there's a lot of variability. Some demis and gray-aces have occasional flare-ups of desire, some say they're indifferent to sex, and others find the thought of it repellent. Some masturbate. Others, like Claudia, even write erotica. "It has no relationship to your actual desire to have sex with someone in real life," she says.

Some demisexuals say they have strong sexual urges that just don't connect to anyone in particular. "I want to have lots of crazy, kinky sex, just not *with* anyone," says Mike, a 27-year-old Canadian who works in a factory. "If someone tried to initiate something, I'd throw my hands in the air and run out of the room screaming."

There is little research on asexuality or its variations, so there's not much in the way of reliable data—on how many people consider themselves asexual or who they are. One 2004 survey in the UK estimated that 1 percent of the population fell somewhere under the asexual umbrella; other estimates range from 0.6 to 5.5 percent. But the few psychologists who have explored asexuality concur: People who don't want to have sex aren't necessarily suffering from a disorder. "It's a concept that is so foreign to most people that they believe there must be some pathological explanation," says

Lori Brotto, a psychologist and associate professor of gynecology at the University of British Columbia. Although there's no definitive proof that hormones have nothing to do with it, most asexuals go through puberty normally and don't seem to have hormonal or physiological problems. In one of Brotto's studies, asexual women's physical arousal responses were no different from other women's.

For people suffering from hypoactive sexual desire disorder—loss of libido—the condition is disturbing because they remember and keenly miss that feeling, says Brotto, who contributed to the criteria for female sexual arousal disorder. By contrast, most asexuals never felt strong sexual desire to begin with, so they're fine with it.

Friends and family, not so much. Brotto's study of 806 men and women, published in 2013 in the journal *Psychology & Sexuality*, found mental health issues were more common among asexuals—perhaps as a result of stigma and isolation. "Everyone is pressuring you: 'Why aren't you dating? You need to get laid. Why aren't you paying attention to these women?'" Mike says. In general, asexuals aren't persecuted so much as shunned and mocked. "We're not demonized—we're laughed at," Genevieve says. In one recent small survey conducted by two psychologists at Canada's Brock University, asexuals were rated negatively. Asexuals just seem less than human, people said.

It's not that

she's a prude, or too shy, or timid, or just hasn't met the right guy. Genevieve is endearingly nerdy, but she's also a bit badass, the kind of person who loves bugs and science but also cracks dirty jokes and looks good in a leather jacket. She's 26, tall and pretty, with long golden hair. (She has taken periodic breaks from school to work and play music.) And—surprise!—she's married to a man she calls the love of her life, a rugged Tennessee country guy named James.

As a kid, Genevieve had a few crushes on both boys and girls, but it was always romantic, not sexual: She dreamed about

holding hands or talking for hours on the phone. “The idea of it becoming more than hand-holding was really weird,” she says. In high school, life got harder. Other kids started calling her android and cold fish and generally made her feel like a freak. She began to worry there *was* something wrong with her. She even went to a doctor, but he laughed it off: You’re so pretty, you’re young, don’t worry about it. “There was no knowledge, there was nothing,” she says. “It was a black hole.”

So she dedicated herself to music, her true love. By the time she was 17 her band had a small but devoted following, and they were opening for big-time acts and hanging around backstage with bona fide rock stars. But despite being a teenager let loose in a raunchy, libertine world of groupies and stars and promiscuity, she wasn’t interested. It wasn’t that she was antisex in principle or morally opposed to what she saw. That part of the scene just didn’t appeal to her, and she knew she’d soon be expected to play along by making her image sexier, wearing her skirts shorter and her tops tighter. Disillusioned, she quit the world of rock and roll: “I thought it was about art, and they were just going backstage and fucking people.”

Around that time, she met James online. After months of close friendship, they dated for a year long-distance, and then she moved to Tennessee to be nearer to him. “I knew we didn’t line up in terms of sex drive, but he didn’t hold it against me,” she says. He was patient—very patient. It would be three years after they met that she felt the pull of desire for the first time and their relationship became sexual. “I think when I knew him so well that my heart decided he was my soul mate, my body decided so too,” she wrote on her Tumblr.

Figuring out how to be happy together required a lot of talking, given the gap between their natural levels of desire. But just like any couple, they’ve figured out how to compromise. They got married last spring, and they seem to still be in honeymoon mode.

She didn’t know there was a word for how she felt until last fall, when she got into a deep conversation with a grad student at the outreach center. He suggested she might be demisexual, and after many hours of Googling and Tumblring, a light went on and she realized she finally had a home. “I found others who had a word for it—a culture, a family,” she says. “When I realized I could just be myself, and there was actually a word for it and there were others like me and it was OK, it was a *huge* weight lifted off of me.”

0 7 7

“WHEN MY HEART DECIDED
HE WAS MY SOUL MATE,
MY BODY DECIDED SO TOO.”

Over curries at a Thai restaurant near campus, Genevieve, Sean, and Rae lament the almost complete invisibility of asexuality and its variations in mainstream culture. Last summer, an asexual woman, Julie Sondra Decker, published a primer on the subject, *The Invisible Orientation: An Introduction to Asexuality*. And there have been a few pop culture glimmers, such as the recent flurry over Daryl Dixon, a character on the zombie show *The Walking Dead*. A fan fave, Dixon is a mysterious, brooding hero who’s never been involved in any romantic or sexual scenarios. Responding to speculation that the character was gay, creator Robert Kirkman recently described Dixon as “somewhat asexual” during an episode recap. “Tumblr exploded,” Genevieve says. “Yeah, it’s just a television show ... but this just doesn’t happen.”

If nothing else, demisexuals and their related subgroups show the rest of us, regardless of sexual orientation, that our version of love and relationships is still very limited, very 1.0. Even the most progressive definition of normal sexuality, and the social expectations that go along with it, may still be far too narrow. If demisexuals and gray-aces can connect and form new types of relationships, ones that mix and match elements of lust, intimacy, domestic life, romance, and passion, perhaps others can too. Maybe there are more surprises in store, new positions along the sexual spectrum that are yet unnamed and still looking for a voice and recognition.

Back at the restaurant, the rhythm of a college-town Friday evening is kicking in. Despite the drizzle, clusters of young women in sparkly skirts and too-high heels drift by, suited up for a night of partying and no-strings-attached lust. The people sitting at the next table are clearly eavesdropping, and they seem half scandalized and half bewildered by our talk about asexuality. Genevieve, Sean, and Rae don’t even notice the stares. For them, the feeling of liberation is still new and thrilling. “I spent 15 years being embarrassed about everything, and I’m not doing that anymore,” Rae says. If it’s not quite asexual pride, it’s something very close. ■

KAT MCGOWAN (@mcgowankat) writes about science and biomedicine. This is her first article for WIRED.



BREAKUP

■ Ted* and I laughed all the time together. We laughed when I lay on top of him and made our naked bodies touch as much as possible—our noses, our lips, our kneecaps, our palms, our big toes. We laughed when we walked from Tribeca to the Upper East Side to log steps on his Fitbit after three days of eating tiramisu in bed—only to find out he wasn't wearing his Fitbit.

For Christmas, Ted's mom had given her kids Fitbits and connected scales. I'd set Ted's scale up for us. He could step on it and, given his weight (about 165 pounds), it would identify him and send his data to his Fitbit profile. And when I stepped on the scale, the technology knew it was me (about 135 pounds). Each person's info was inaccessible to other users of the scale.

It wasn't all laughs: We'd broken up a couple of times, then quickly gotten back together. But after our latest drunken fight, I'd texted, *We're done*. The next morning I woke up wondering what Ted had texted back. But there was no text. I decided to wait two more hours. He'd call. I lay staring at the ceiling. Four hours later, still nothing. I wasn't going to reach out. He was the one who owed me an apology. I'd give him another hour.

He didn't text. I rented a movie. And then another. Then I ordered food. I spent all day in my apartment, waiting, watching movies, checking my phone. Around 10 pm I turned off the TV, sat down at my desk, and opened my laptop. I clicked around my bookmarks—the *Daily Mail* for photos of celebrities I'd never heard of, *Food 52* for

photos of cobblers I'd never make, Fitbit for goals I'd make but never maintain.

But the number next to my profile read 126.6 pounds, logged at 9 pm. Hmm. I was pretty sure I was 136.6 yesterday. But I'd weighed myself around 9 am. 126.6 at 9 pm ... today? That was an hour ago! Had the synchronizing gotten screwy? And then suddenly I imagined the naked backside of a 126.6-pound woman standing on the scale at the foot of Ted's bed, and I realized: He wasn't going to text, he wasn't going to call, he wasn't going to apologize. —BREE MORTIMER

64% of American high school seniors have had sex

14% of high school students did not use birth

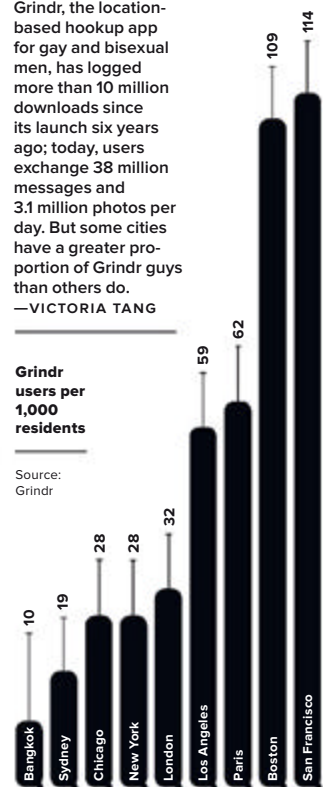
HOOKUP CITY

Grindr, the location-based hookup app for gay and bisexual men, has logged more than 10 million downloads since its launch six years ago; today, users exchange 38 million messages and 3.1 million photos per day. But some cities have a greater proportion of Grindr guys than others do.

—VICTORIA TANG

Grindr users per 1,000 residents

Source: Grindr



HOW TO SAFE *Sext* →



FACT: SEXTING IS FUN. Even celebrities who should perhaps know better are snapping nude selfies. But fret not, horny phone-clutching hordes, there is such a thing as safe sexting. Behold—four seemingly dirty images that, on closer inspection, turn out to be audaciously innocent. Study, practice, then hand this list to a nearby teen. —LAUREN BANS

THE CLEAVAGE CREASE

It's as if God gave us fleshy inner arms for this specific reason. Bend tightly at the elbow until ample flesh pops up along the crease of your arm. Hold your phone ½ inch away from the fold. Snap away. Voilà! The suggestion of a magnificent pair of breasts.

*Name has been changed



MY STORY

THE

ROMANCE

OF

Grindr

► I remember so many details about him—his upbringing, the things he hated about his job, how he sounded reaching orgasm—but not his name.

He had big, moody eyes and curly brown hair. Or was it black? It's hard to tell someone's hair color on a smartphone screen, and when we finally met in person I was focused on other things.

He was visiting San Francisco for a tech conference. We had messaged on Grindr earlier that week and planned to meet at a rooftop bar, a quick walk to his bed or mine. I headed over straight from the office, unsure if I would recognize him. *All in black. Bright green shoes*, he'd texted.

The terrace was buzzing with young people, but they faded into the background as I quizzed him on his faraway life—the complications of commuting across the US–Canada border, the cultural divide between his South American parents and their North American neighbors.

He told me about his last boyfriend, their engagement, and the breakup six months prior. He told me about getting circumcised to please his fiancé; he said that he didn't care either way.

Our easy conversation made for great foreplay, building trust that's impossible to form via text messages and pro-

file pics. No matter how perfect someone's digital persona might be, for me, face-to-face conversation always makes the sex better.

We headed for his hotel. I clutched his hand and kissed him in the elevator, feeling oddly sentimental as I pictured how we looked from the dark street below. As good as the sex was, that moment on our way to his room, so radiant with anticipation, is still more vivid, even months later. I'm addicted to these apps because of moments like that—windows onto infinite potential futures, glimpses into the lives of men I would never encounter otherwise.

Leaving the hotel, as I glided down 30 stories in that same glass-walled elevator I looked out at San Francisco's glittering skyline and snapped a photo with my phone. By the time I reached the lobby, I'd cropped the image, added a nostalgia-tinted filter, tagged my location, and posted it on Instagram.

The next morning I awoke to a notification that @Westinstfr had commented on my photo: *We hope you enjoy your time with us!*

With a few keystrokes, I responded. *It was lovely.*

—HUNTER
OATMAN-STANFORD



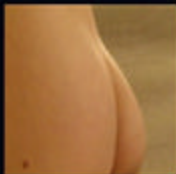
control the most recent time they had sex ■ ■ ■ **66%** of sexually active teen girls get contraception ■ ■ ■ ■ ■

0 7 9



THE I-WANT-IT-SO-BAD-IT-HURTS

Nothing conveys excitement (or "I need to pee") like a pair of tightly crossed thighs. But you don't need to use your thighs. Your middle and pointer finger will work just fine. Cross them tightly, shoot. Bonus: Add a tiny strip of black lace for instant lingerie.



THE ULTIMATE BOOTY

Same as the Cleavage Crease, except this time you're bending your knee. Men, depending on their hairiness level, may have to shave their inner leg for this. To make this fake butt look even more bootyful, brush bronzer along the line of the crease. Pow.



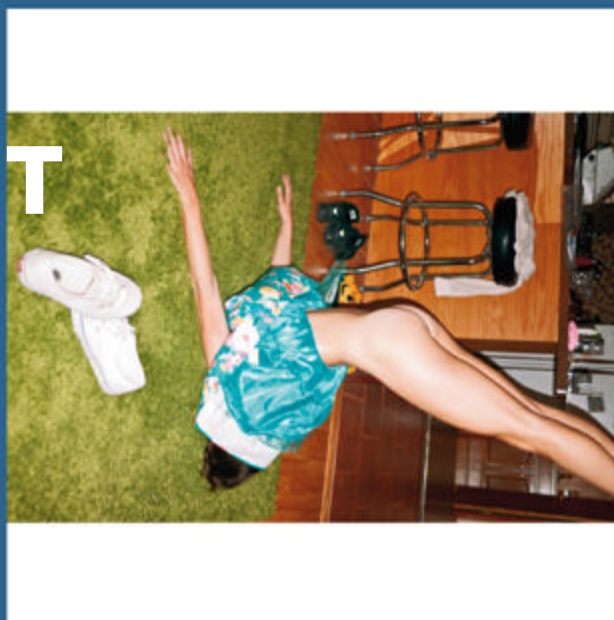
THE EXPLICIT EYE CANDY

For the brave: The eye, shot very close up and rotated vertical, looks remarkably like a meticulously groomed vagina.



T O 🤔

H 🔥 T



Blaise Cepis, 30
@itsalrightwerealright
13.1K followers
Photos deleted: 10

"When I'm doing shoots, I actually take Instagram into consideration. I don't hold back when I'm shooting for my personal work or for books and editorials, but to reach a bigger audience I usually have to put something on Instagram. So I have to think a bit more creatively about how to show those images without having to pixelate stuff—taking some extra minutes to position the body so something gets lost in the folds and abstractions, or to do a wardrobe change. Sometimes I think it strengthens my work. But sometimes you just want to put up a fucking image and not worry about everyone's feelings."

THE
SEXY PICS
THAT
GOT
PHOTOGRAPHERS
KICKED
OFF
INSTAGRAM.

BY JASON KEHE

I

Gianna Leo Falcon, 30
Now off Instagram
Accounts deleted: 2

"I live in New York City. At every turn of your head you're bombarded by images of women in advertisements who look nothing like you. It's a twisted, bizarre fate that we'd be kicked off Instagram for fine-art nudes when our culture lives and breathes sex in every image we're presented with. An advertisement is sex, but nipples are not exposed. What about a nipple is more sexual than, let's say, a woman in a bathing suit on a beach with her legs spread open and making a sexual face at the camera?"



T



H A N D L E

NO NUDITY. That's always been Instagram's policy, and it likely won't change. But for a platform that's home to a growing community of artists deeply committed to free expression, it's an invitation to transgress. Liberated nipples, a round tush, stray pubic hairs: Every day, digitally savvy art photographers post images that push right up against, if not right past, Instagram's strict guidelines. The occasional nip slip won't land anyone in Instajail, but repeat offenders risk a much scarier outcome: account deletion. When that hap-

pens, you lose everything—handle, precious photos, more-precious followers, likes, comments, identity. "It's poof!" as one victim puts it. "Nothing." For artists who use Instagram to build their audience and even to sell images, deletion can be devastating. ¶ Instagram is not unsympathetic. In fact, many of the artists, filmmakers, and photojournalists who work at the company would love to see a tasteful nude from a great photographer get a thousand likes in an afternoon. What they're afraid of is pornography. Let it prolif-



John Arsenault, 43
@johnarsenaultphoto
31.9K followers
Accounts deleted: 2

"I'm desensitized to the work that I create, because it's about me and putting myself out there. Being gay, I promised myself I would never hide from who I am, including in my work. There's often nudity, but I'm not exposing myself for shock value or to tantalize people. When I'm shooting myself nude, I've had to get to a place where I feel comfortable. It's unfortunate that I can't post a lot of my artwork because some people find it offensive. I don't agree—it's not pornographic, it's not harmful; it's created to generate a dialog and show a vulnerability—but I made a decision to play by the rules, and today I'm OK with that."



erate, and Instagram could get slapped with a deadly 17+ rating from the App Store. Then there is Instagram's massive international audience to think about: 70 percent of users live outside the US, many in countries with more conservative cultural and artistic standards. "I went to film school. I love photography," says Nicky Jackson Colaco, who runs Instagram's public policy. "But we want to make Instagram available to as many people as possible. These are hard questions." ¶ It's not as if Instagram goes hunting, Inquisition-like, for every vio-

lation. A global team of moderators—yes, real humans—acts only when a photo is flagged as inappropriate by an account's followers. (There's no minimum requirement: A single complaint generates a report.) If the photo violates the rules, Instagram takes it down and sends a warning email. If this happens enough times, or a violation is especially extreme, the account gets permanently disabled. ¶ There are exceptions to Instagram's policy. Breastfeeding and postmastectomy photos are always allowed, as are butts pho-



Magdalena Wosinska, 31
@themagdalenaexperience
55.8K followers
Accounts deleted: 1

"Instagram is an awesome tool, but now I'm scared to post anything. I wish they'd contact you first and ask you to take a photo down yourself, rather than surprising you with deletion. I wish I knew the rules a little better, straight up. I don't know what I'll get in trouble for. They don't want a 13-year-old seeing nudity—I get it. But there's so much raw sexual stuff, and people never get caught or deleted. If they're going to censor people, they should censor people equally."





Alexandra Marzella, 24
@artburp6666
6.3K followers
Accounts deleted: 14

"My 14th account was actually restored. I just keep going back on principle. It's a bad thing that we consider nudity offensive at all. I thought about whether I wanted to explore nudity in my art. At first I justified it because I have a beautiful body, I'm young, and I want to share it with the world. But now it's very much about the hippie-dippie shit—loving yourself and being comfortable in your skin. The world would be a better place if everyone were naked. Sometimes I'll censor nipples or vaginas. But that's bending over for The Man a little bit, which is understandable, but at the same time it's the saddest thing in the world."

Lula Hyers, 17
@lulahyers66
2.6K followers
Accounts deleted: 1

"I haven't always been conscious of the oversexualization of the female body, but it really hit me when Instagram took this down. Porn has infiltrated popular culture to the point where things that would've been normal now seem raunchy, dirty. This was an intimate moment between my friend and her boyfriend. We were all laughing. He spit in her mouth! Nudity has become so attached to pornography that many have forgotten that they are actually very different things. I want people to unlearn what they've been taught about the naked body. If we're able to achieve this, there will be serious changes in how people act toward women."



tographed at a suitable distance. Then there's the controversial cover-up clause, designed to keep the app from being overrun by porn. As long as offending body parts are blocked from view—a practice few pornographers are willing to bother with—the image is safe from deletion. That leaves nonpornographers interested in nudity to turn to digital pasties: Blur effects, lens flares, and black bars have come to dominate Instagram's fine-art nudes. ¶ Still, photographers push back. They complain that Instagram's rules are arbitrarily enforced

and poorly explained. How many warnings, for instance, are you allowed before a ban? (The answer: in most cases multiple, though Instagram won't provide an exact number.) Will your account ever be restored? (Possibly, but not likely.) Instagram reviews hundreds of thousands of complaints each week. Many accounts are deleted, but most of the photographers we spoke to are back, and baring all. [W](#)

JASON KEHE (@jkehe) wrote about movie trailers in issue 21.07.



Members Only

IF YOU GO ON THE INTERNET,
YOU'RE GOING TO SEE DICK PICS.
YOU MIGHT EVEN SEE YOUR OWN.

GET OVER IT.

A few years ago, someone broke into my email and then used it to get into all sorts of other things. Among the very many things I panicked about was: Will they see my nude pictures? Because like everyone else, I have hackable pictures of myself naked.

These are not sexual, come-hither images. There's a photo of me wading into a freezing stream on a backpacking trip, 10,000 feet up. In one I'm naked by a glacier, getting my courage up for a plunge in the pool at its base. There are a bunch of them, from multiple trips. Goofy photos that add up to a collage of high-altitude nudies.

In the end, none got out. (Phew.) But if they had been circulated, I would have felt pretty embarrassed—and that's irrational.

In the beginning, we are all naked and unashamed. As children we run through backyard sprinklers and into oceans unencumbered by garments. But age and society train us to hide our native forms. They train us that certain parts of our bodies are different from others and that we should hide them. Yet cultural norms are different in different places and different times. Were this the 19th century, our mere ankles would offend. Yet today in Scandinavia, we might get naked and sit in a sauna—men and women alike—without sweating it.

It's time for the cultural norm that says nude photos are shameful or shocking to end. There are simply too many naked pictures of too many people—and they're about to be all over our screens.

Take sexts. Sexting is great. Sharing an intimate moment when we're not physically

BY
MAT HONAN

0 8 7

together with someone we love is a gift. But that gift can turn into a curse when the intimate moment becomes less intimate—when a photograph is broadcast widely in the service of revenge, belittlement, objectification, or bragging rights.

Such incidents are, rightly, described in terms of assault. They are not just gross violations of privacy and trust, they are often crimes. And the wretched little shits who perpetrate them ought to be shunned, prosecuted, and imprisoned.

Yet we should also recognize that it is only the creeps who seek to distribute those photos, or access them once distributed, who have done something shameful. There is nothing to be ashamed of in having taken a naked picture and sent it to another person who consents to it.

But this is not an argument in favor of sexting; it is an argument against shame. Fortunately, that shame may solve itself—because we are all about to get naked on the Internet. Even discounting sexts, nude images of ordinary people will soon be ubiquitous. There are just so many naked pictures of you to choose from.

There are the ones that we're starting to see already: images from webcams and home-security cameras that are either hacked or inadvertently broadcast to the net. There are illicit ones from the doctor's

office. There are the ones from the TSA scanner. There are cameras *everywhere*.

Matt Haughey, founder of MetaFilter, recently got caught in this pervasive web of digital imagers. He has an Internet-connected Dropcam pulling security duty in his house, and one day he walked past it naked. The camera captured its jaybirdly owner and uploaded it to *the cloud*. The Dropcam then, helpfully, sent a notification to Haughey's email that something had moved in his home. Something naked. Haughey mused on his blog how easy it could be for someone to see his junk. He has a point.

Everything you feel, smell, and see is leaking onto the Internet, just as everything is becoming a camera. A Really Good Camera. Perhaps your naked image is already on a neighbor's Dropcam, which happened to see in your window as you walked past without any pants on. Maybe it was caught by a Google Street View camera or in the reflection in a mirror pond as a drone zoomed over, filming in 4K. *Snap*!

The nudes are out there.

In the coming years, when you Google someone's name, it won't be shocking to see nude pictures interspersed among the results, no big deal: *LinkedIn profile, professional society award, naked picture, Facebook Page (private)*, and so on. We just have to stop caring about other people's nudity. We should quit being shocked, and we should quit being shamed, because the shame is not ours, only the genitals are. And your genitals are wonderful. You should show them to the world. ■



MY STORY

TRACKING

PEAK

Horniness

◆ I never tracked my period until I tried to get pregnant. I went blithely through my sexually active youth, assuming my period would show up eventually because I was careful about birth control, and it always did.

I could not be so nonchalant when my husband and I were trying to con-

ceive. Suddenly the number of days between periods had portentous meaning: If I could accu-

rately track my period, I could tell when I was ovulating and try to plan a pregnancy based on

that information.

Enter Period Tracker Lite, an iPhone app with a cheerful pink flower icon. It not only allows you to track your period but also your various symptoms and moods throughout the month. Feeling crampy today? You can note that with an angry-looking star symbol on

your calendar.

Feeling “confused” or “unbalanced”? You can note that too, with emoji-like faces.

I expected the app would help me figure out when I was ovulating. I did not expect to discover that every single month, the week before my period, I became—in the sanitized par-

lance of the app—extremely “flirty.” Which is to say: insatiably, insanely horny. This had no biological purpose, really; I probably wasn’t ovulating during these randy days, since women ovulate about two weeks before their periods start.

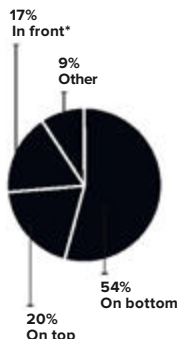
But the information was something of a mental salve: It’s not that I’m aroused by watching Dave Foley in old episodes of *NewsRadio* on Hulu; it’s just the hormones talking. Possessing this information hasn’t altered my sex life dramatically, but my husband certainly doesn’t complain about the uptick in my romantic instigation. If nothing else, the preperiod sexfest makes the unpleasantness of menstruation easier to bear; at least the pain of cramps comes after some serious pleasure. —JESSICA GROSE



GETTING DOWN TO GET KNOCKED UP

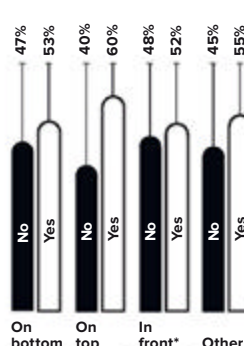
The Glow app tracks sex stats for conception-focused couples, and its data scientists note the following: Baby-wanting ladies report more action when they're ovulating. Duh. Also: For a majority, being on top is better for getting off, but women spend more than half of sexin' sessions on their backs. Doh! —V.T.

Female position breakdown

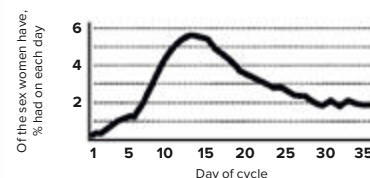


*Includes doggy style, sideways, standing, etc.

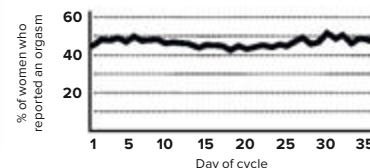
Female orgasm frequency by position



Women trying to get pregnant are most likely to have sex on days 12–14 of their cycle ...



... but the highest rate of orgasm is on day 30.



Source: Glow

6 % Drop in US teen births that can be attributed to the show *16 and Pregnant* 13 States where sex ed is required to be medically accurate

MY STORY

GENDER-HACKING

ON OKCUPID

I had just graduated from college in 2010 and was trying to navigate dating in the real world. So, like everyone else in my age bracket, I went on OkCupid.

Here's the thing about OkCupid—before you can even fill out a profile, you're asked for your gender and what gender you're interested in. Which, yeah, makes total sense for a dating website, sure. But at the time, this wasn't simple for me—I wasn't really

sure *what* gender I fit into. In college I had always identified as a butch lesbian, but I had recently started coming to terms with the fact that I might be a dude in a woman's body.

I didn't want to let this confusion limit my dating opportunities. So I came up with the following solution: I set up two essentially identical profiles—one as a woman looking for women, one as a man looking for men. I had always identified myself as queer, so it seemed logical to stick with what I knew. Both profiles included the same picture and the same answers to all the questions (more or less). Neither mentioned anything about my gender; I let people figure that one out on their own, just as I was trying to figure it out on *my* own.

Looking back now, this was the first time I had ever confidently presented myself to the world as male without apologizing or explaining or worrying what people would think. So when I went to check the activity on OkCupid a few days later, I was delighted to see I had roughly the same number of messages in the inboxes of both accounts. And not a single one of them said anything about my gender; they just accepted me for whatever I'd said I was. Man, it felt *great*.

—H. TUCKER ROSEBROCK

NEXT
VR PORNOGRAPHY



PORNOCOPIA



THE IMMERSIVE
FUTURE OF VIRTUAL
REALITY SEX.

BY PETER RUBIN



STEPHEN DOYLE



AS A KID,

ELA DARLING fell in love with the idea of virtual reality. This was the late '90s, early 2000s; *Johnny Mnemonic* and the Nintendo Virtual Boy had already come and gone, and VR had moved from

brain-busting sci-fi concept to schlocky punch line to faded cultural footnote. But still, Darling was an avid reader and D&D player, and the idea of getting lost in an immersive world—"making visual what I was already losing myself in books for," as she puts it—was something she found not just exciting but romantic.

Not surprisingly for an active reader, Darling went on to get a master's degree and become a librarian. Perhaps more surprisingly, she then stopped being a librarian and started acting in pornographic movies. (Yes, that means she officially became a sexy librarian. Fun fact: She has the Dewey decimal number for the Harry Potter books tattooed on her back.) And after a few years of bondage scenes, masturbation videos, and girl-on-girl movies, Darling attended the E3 videogame trade show and tried an early version of the Oculus Rift, the headset that jump-started the current VR revolution. "The first thing I think of when I hear of new technology," she says, "is 'How can I fuck with it?' or 'How can I let people watch me fucking on it?'" Usually there's one or the other application if you think hard enough." With Oculus, Darling didn't have to think too hard at all; now, at 28, she's busy forging a future as creative director (and star performer) of VRtube, a nascent online studio and distribution center for VR porn.

It's not just enterprising actresses who think this way. Call it Rule 34a: Whenever a new media technology appears on the horizon, someone pops into a comment thread to say, "I can't wait to see what the porn industry is gonna do with *this*." And indeed, from VCRs to CD-ROMs to streaming video, nearly every home entertainment platform of the past 40 years was either popularized or downright pioneered by companies that could help people watch other people getting freaky. It generally works out well for everyone: If half of all videotapes for sale in the US in the late '70s hadn't been X-rated, it might have taken VCRs a lot longer to reach critical mass in the early '80s.

Yet no visual technology has ever been so perfectly suited to sexual applications as VR. Yes, video brought sexually explicit content from theaters into homes, but virtual reality promises to eclipse even that shift. Historically, we've found titillation at a remove. In erotic woodcuts, DVDs, even streaming webcam shows, there's a frame—whether a book, a Polaroid border, or a screen—through which we experience whatever it is that turns us on. VR is more than just another iteration. It doesn't just change the frame. VR erases it. It allows us to exist *inside* the environment. The NSFW possibilities are endless. Yes, we're at the dawn of this thing, and all the easy points of reference—*Star Trek's* holodeck, the Matrix, *Community's* Dreamatorium—are years of refinement and R&D away. The

real question is what we'll do in Year One.

Here's what we're *not* going to do: pull a *Lawnmower Man*. That is, we're not going to put on full-body haptic suits, climb into gyroscopes, and transform ourselves into shimmering posthuman forms that overcome our bodily shackles and merge with one another in a transcendent liquid singularity. A huge part of the reason VR has finally tipped into mainstream consciousness is that it's lightweight and low-footprint: a headset display, some sort of input controller, and sound. Sure, the libidinally aspirational can shell out for omnidirectional treadmills and mo-cap harnesses to facilitate Peak Air-Hump. Japanese sex-toy company Tenga has even helped design a complicated prototype that syncs a virtual sex simulator with ... well, you can imagine with what. But for the foreseeable future, VR will be aural and visual only; if localized tactile feedback is what you're after, you're gonna need to handle that yourself. (Good riddance, "teleildonics." You're the worst word ever, and you'll be despised long after your passing.)

We're also not going to lose ourselves in a panoply of CGI flesh calibrated to our every kink and whim. Not that people haven't tried: The past two years of VR game development are littered with the husks of abandoned projects with names like *Sinful Robot*. The problem is, as their developers learned, creating a fluid 360-degree videogame is already difficult—and making it stereoscopic and photo-realistic complicates things exponentially. Players can handle the janky facial animations in an action game like *Far Cry 4* because they're secondary to the purpose of the game (i.e., Shoot Everything). Certainly,

WITH VR, YOU'RE NOT WATCHING
A SCENE ANYMORE.

YOU'RE INHABITING IT.

depictions of sex can be arousing at low fidelity, as erotic comic books and vast swaths of *hentai* anime suggest. But obliterate the proscenium the way VR does and suddenly those lossy signals lead straight to the uncanny valley, that very unsexy place where things look sorta real but not real at all. The vast majority of VR-capable “adult games” are *Second Life*-like knock-offs with graphics that look like waxy (and waxed) blow-up dolls. While a VR version of phone or FaceTime sex isn’t tenable yet—even if you could see each other, you’d have headsets on—the most promising avenue appears to be 360-degree 3-D video, like the kind some people are using to produce VR concert experiences or the projects showcased at Sundance’s New Frontiers program in January.

Regardless, what we *are* going to do is find something virtually (sorry) unheard-of in pornography: intimacy. The thing that’s going to take us there is “presence,” that phenomenon that occurs when head-tracking latency, screen quality, and processing wizardry combine to trick your brain into thinking that you’re existing in a virtual space, rather than just watching a screen that extends past the edges of your vision. If your brain believes it, your body reacts in kind—with all the responses that come along with that.

So if you’re standing at the edge of a skyscraper in VR and you lean over the side, you experience vertigo. If you’re in a darkened corridor on an alien spaceship and you hear a rustle behind you, you freak the fuck out—full, heart-pounding fight-or-flight response. If you’re sitting in a musician’s apartment while he noodles on a piano, his dog sleeping behind you on the hardwood floor, you feel serene. (This isn’t speculation; I’ve done all those things in various VR environments—some CG, some video—and I’ve had all those reactions.)

The big question is whether sexual content in VR will induce the same reptile-brain response. Ela Darling would certainly like to know. She found like-minded colleagues last year when they posted on Reddit about wanting to make VR porn. They flew her from California to Maryland last April; in true tech startup fashion, they turned out to be 20-year-old college students. (“It was very *Weird Science*,” Darling says.) Nonetheless, they shot a test scene in their dorm room. Rather than invest in an array of pricey high-end Red cameras like many other fledgling VR video companies, they went decidedly DIY, taping together two GoPro cameras to create a stereoscopic 3-D image with a wide field of view on the cheap. (Again in true tech startup fashion, Darling initially wore an R2-D2 swimsuit.) After she flew back to LA, one of the students emailed her; he’d finished processing the test scene and was so blown away by the result that he wanted her to be a partner in the venture. “This is unlike any porn I’ve seen,” he wrote. “It’s like I’m watching an actual person.”

That’s a lot of quote to unpack. The subtext suggests that things critics of porn say are true—that it dehumanizes its actors. But pornography has always been fantasy: the fantasy of abandon, of the exotic, of being desired. For years, the adult industry has catered



When Ela Darling and her collaborators filmed some test footage for the Oculus Rift, what they found wasn't just titillating, but human.

to that fantasy by producing a genre called POV, in which an actor holds a camera or a camera operator films over a performer’s shoulder; it’s meant to create the illusion that the viewer is a participant rather than a voyeur. But beneath that illusion is the awareness that it’s just that—an illusion. In VR, the frame of detachment disappears, and fantasy effectively does too. You’re not watching a scene anymore; you’re inhabiting it. And by being there, you’re implicated in whatever’s happening.

Does that make things more arousing? More awkward? It depends on the scene. It depends on the person watching it. But that potential to put viewers on equal footing with the fantasy they wanted to see promises to upend pornography in a way no one has considered. Nearly a year after they shot that test footage, Darling and her partner are hard at work perfecting a new iteration of their filming rig—they’re still chasing the elusive 360-degree immersion and at press time were shooting for a springtime relaunch of their site—but she knows they’re on the right track. And she’s ready for the revolution. “I’ve got notebooks full of porn ideas that I’ve kept for years,” she says. “And with a lot of it, I’m now realizing it depends on cinematography that I can’t apply to this. This requires an entirely new approach.”

Senior editor **PETER RUBIN**

(@provenself) writes frequently about virtual reality for WIRED.



102+ M

Views of "Kim Kardashian Sex Tape With Ray J" on Pornhub

3.2+ M

Views of "Female French Painter Gets Painted



MY STORY

SEX ROBOTS

BROUGHT
US TOGETHER

People don't enter the field of robotics for the sex. I certainly didn't, but I did find my wife thanks to a robot—the pulsating crotch of a robot.

I was a PhD candidate at the Robotics Institute of Carnegie Mellon University. I built environments that sensed their occupants and reacted accordingly. For one project, my occupants were elderly people, so part of my job was figuring out how they might incorporate robots into their lives.

At a house party one night, a mathemat-



SHYAMA GOLDEN

A black and white photograph focusing on a person's arm and hand. The arm, positioned diagonally from the top left, features a large, detailed tattoo with geometric and floral patterns. A hand with dark, glossy nail polish rests gently on the arm. A ring with three small, dark stones is visible on the ring finger. The background is a solid, deep black, creating a high-contrast, moody aesthetic.

Once, a man booked a session with me and then claimed he was a Broadway producer—he said

he'd flown into town because he was a longtime fan and wanted to meet me. I said, "Sure you are, now get on your knees." For the entire hour he insisted, saying, "Look me up, I have a Tony." Usually when a client left I'd close the front door quickly, but this time I watched him walk to the curb, where a uniformed driver ushered him into a limousine. Later I found his face in *The New York Times*.

That was when I

started to realize I was not maximizing my earning potential. In the seven years since, the Internet has revolutionized virtual one-on-one encounters. For a number of reasons—faster home Internet connections and a rise in video content piracy, to name two—webcam shows have skyrocketed. In 2013, my coworker Maitresse Madeline combined the webcam with the Internet auction. She invited

The final bid came from an Australian man. A few weeks later, he sent the payment: **\$42,000**. He had paid the same amount for an hour with Madeline months before. (He still has not booked the shows.) To celebrate, Madeline and I scheduled a photo shoot, throwing all **\$84,000** in cash on the studio floor, dressing up in latex, and rolling in it.

—LORELEI LEE

and slightly horrified, I agreed to meet her in Pittsburgh. She was 5 feet tall and blond beyond belief, with a spiked bracelet and a smirk that said she was smarter than me. During her visit, the two of us leaped straight into a discussion about sex and math. I have no resistance to that combination of topics. Neither did she. We were both defenseless.

Our passion for Vibester fizzled after we learned that the field was called teledildonics. Yick. By that point we were entangled in

They were conceived face-to-face.

—DANIEL H. WILSON

CLAYTON CUBITT

OH *Come* NOW

INTRODUCING TWO
REVOLUTIONARY
SEX TOYS*

BY
RACHEL GROSS

HELLO TOUCH X

◆ When it comes to pleasure peripherals, dildos aren't for everyone. So some companies are thinking outside the (dick in a) box with new sex toys, like Jimmyjane's powerful fingertip vibrator. Inspired by Sigourney's cyborg suit in *Aliens*, it's meant to be an extension of your body.

Two-pronged touch
Most ladies want stroking, not just poking, so for its signature model, Jimmyjane took inspiration from the popular Rabbit vibrator, building two flexible vibrating fingerpads—like rabbit ears—to deliver clitoral sensation in stereo.

Coin motors
Fingertip vibes often use large DC motors, but the X hides a 14,000-rpm coin motor, half the size of a penny, in the sleeve of each pad. Designers tested its intensity and power with an accelerometer until it outperformed the competition.

Charging pack
The disposable AAAs in many buzzies drain quickly, forcing you to choose between your TV remote and your orgasm. The X's lithium-ion battery delivers stronger vibrations and recharges with a USB cable.

Silicone sheath
Materials in sex toys are largely unregulated, but these fingerpads are made of nonporous, medical-grade silicone to help keep bacteria at bay. A waterproof seal around the battery pack connection protects its insides.

E-stimulation
Vibratory caresses not intense enough for you? The X has two electrical stimulation pads, one positive, one negative. Once your skin completes the circuit, up to 15 milliamps of current increase blood flow and contract muscles. Yowza!

*PLUS
14
TOP-SELLING
DILDOS

Companies like Jimmyjane and Dame may be transcending the limitations of penis imitation, but the dildo still towers over the competition. At erotic shop Adam & Eve, which sells 2 million-plus sex toys a year, 14 of the top 25 are penis-shaped (more or less).

EVA

◆ Most vibrators need hands to keep them in place—which prevents fingers from doing other, funner things. So sex educator Alexandra Fine set out to find a hands-free fix. After a DIY attempt involving a half-dollar wrapped in Saran wrap, she teamed up with mechanical engineer Janet Lieberman to form Dame Products. The result: an innovative, low-profile couples vibrator for the cliterati. Look, ma, no hands!



Location matters

Many clit-specific vibrators are U-shaped, to hook inside—but they tend to have a numbing effect on your partner. The Eva sits directly over the clitoris, applying vibration just where it's wanted.

Loving arms

Friends who volunteered for testing complained that the vibrator fell off while doing the deed. So Lieberman gave it wings to stay in place. "As you open and close your legs," Fine says, "it opens and closes its wings with you."

Flexible fit

Lieberman used a 3-D printer to iterate the flexible wings 75 times. She played with materials, curves, and angles to create a lightweight plastic form that would bend and snap back, helping the Eva stay snug.

Powerhouse

The Eva is powerful despite its size, packing 7 g's of acceleration into a petite 1.1-inch egg. Users cycle through three pulse strengths by pressing a large, easy-to-access button in the center.

Rubber cover

To encase the Eva's funky shape in silicone, Fine couldn't use traditional injection molding—its high temperatures would damage the electronics inside. So she vulcanized the rubber with a cooler curing process.

PROP STYLING: ROBIN FINLAY; ILLUSTRATIONS BY CHRIS PHILLIPS

Wild G-Spot Vibrator
159K (units sold in 2014)



A&E Butterfly Kiss
83K



8" All-American Whopper Dong
74K



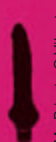
Wet Rabbit Vibrator
65K



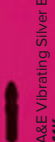
Eve's Slim Pink Pleaser
59K



Blue Dolphin Vibrator
53K



My Private O Vibrator
48K



A&E Vibrating Silver Bullet 2.0
41K



So Real 6" Realistic Dildo
35K



Rotating Rabbit Vibrator
34K



A&E Pink Jelly Slim Dildo
33K



16-Function Super Rabbit Vibrator
32K

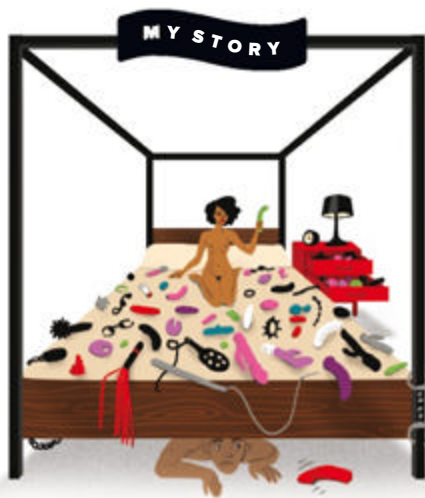


10" Hollow Dreams Strap-On
31K



A&E G-Gasm Delight
27K





W H E N

Sex Toys

A T T A C K

◆ My introduction to sex toys was not a gentle one. It was more the getting-thrown-into-the-deep-end-of-the-pool-by-your-overcompensatingly-masculine-dad-at-2-because-“FLOATIES ARE FOR PUSSIES. NO SON OF MINE IS GONNA SWIM WITH ARM BALLOONS” of sex-toy initiations.

I was 30 and had just moved to Europe. She was cute, quirky, and way into peacoats and berets. Our relationship was all very adorable and Wes Anderson. I imagined our first night together playfully doing stuff to one another accompanied by '60s French pop on scratchy vinyl in an apartment lit

by Christmas lights. No. Nope. I had cruised through the make-out session and was in familiar foreplay territory with a patient but eager eye cast toward impending sexin' when, “Holy shit, that’s a huge, green dildo, aaaand a bunch of other stuff, and GOOD GOD WHERE THE FUCK DID THIS COME FROM!” Internal dialog, of course. I was trying to play it cool, but Jesus Christ, she was like David Copperfield when he made the Statue of Liberty disappear and reappear, except the lady version that used the power of misdirection (boobs) to transform a once roomy bed into an assemblage of

things that looked either vaguely or explicitly like sex parts. H. R. Giger would’ve nodded approvingly at some of this stuff. I wanted to politely excuse myself and soft shoe into the nearest passenger plane jet intake.

I didn’t know where to start. I gingerly picked up Hulk Smash Dildo and insta-dropped it due to its unexpected flubbery texture. My previously enthusiastic penis was all, “Hey guy, Imma let you figure this one out on your lonesome. Bye.” What a shitty friend.

I was intimidated. I tried to use a thing in a way I figured was in the ballpark of its function and was immediately

and mercifully stopped. We made eye contact. I whimpered. Rather than elbow-drop my ego, she suggested we rewind and discuss. This was necessary. I had questions.

“Does this stuff make my penis numb?”
“Is that a bunny?”
“This looks like Max from *Flight of the Navigator*.”
“Is that for butts?”

“Should I put this on your butt?”
“Does the Koosh Ball side go in your vagina?”
“Can this not be for my butt?”

She was patient and assuaged most of my fears. On-the-job training is really the best way to improve at most things, and I was fortunate enough to have her enthusias-

tic help, which informed even better experiences with my future partners. Most, anyway. The time a neon-purple double dong was suggestively waggled at me was pretty disturbing, but they can’t all be home-run experiences. Ha. Heh. Sex. Jesus.
—DUSTIN HUCKS

PORN BY THE NUMBERS

X-Rated Xs
We scraped data from several years of NaughtyBlog.org links to compare the frequency of the letters in porn actresses’ noms de boink with the frequency of those letters in English usage: Letter *j* occurs 8.5 times more often between the sheets than on the pages of Webster’s. Next comes *x* (Rachel Rxxxx, Stacie Jaxxx), and the porniest porn name turns out to be Jynx Maze. (But you knew that already.)
—MICHAEL BERTIN

Equivalency:
The point at which the occurrence in porn is the same as in English.

Area of circle indicates porn-name letter frequency relative to English.



Bucks for the Bang
Porn careers are so short that most women make little money doing it. According to the NaughtyBlog data, thousands of actresses do only a handful of scenes, giving them total earnings in the low four figures—there’s not much money in money shots. —M.B.

FEMALE PORN STARS
who have done 1–5 scenes:
8,248

... who have done 6–150 scenes:
2,757

Only 22 porn stars have done 151–250 scenes.



MY STORY

SEDUCTION
BY

SPOTIFY

Can a song be a sext? If you'd asked me that question a few years ago, I would have responded with an emphatic "hell no." Songs can be sexy, sure, but they're nowhere as explicit as a lusty photo or a graphic text exchange. But that was before I met a cute Norwegian who was visiting New York on vacation. We had a fleeting, fun summer romance, and after he flew home he friended me on Facebook. We chatted from time to time—typical stuff about our days, dinners, *Homeland*, and *Mad Men*. But then he started to send me songs through Spotify.

At first, the songs were our version of virtual note-passing, shy invitations to learn more about each other's lives, tastes, and

interests. We basked in our shared love of old soul, Fleetwood Mac, and Beyoncé, and I discovered that he was a hardcore hip hop junkie. In turn, I revealed my soft spot for bluegrass country. Our music exchange transmitted a layer of texture and flavor that emails and Facebook messages couldn't convey. It felt like we were making a digital mixtape, a collaborative jukebox that we could update in real time, light-years faster than if we were doing it the old way, with cassette tapes and the postal service.

But then the song exchange began to take on another shape, evolving into sonorous courtship, a game of call-and-response to gauge each other's feelings about our interactions. After I Instagrammed a photo of myself laughing with friends, he sent me a bouncy '90s R&B song called "I Love Your Smile." I responded in kind, sending him "Sweet Talk" by Jessie Ware. Once, after a long and involved Facebook chat, he sent me a song called "Best Love" by Georgia Anne Muldrow, and I listened to the chorus, which loops the words "You know I wanna give my best love to you," and swooned.

I was falling hard. But was he? It's difficult to misinterpret an outright declaration of love, or even of lust, like an X-rated photograph, but songs are more mysterious and opaque. I found myself obsessing over hidden meanings behind the steamy "Fire We Make" duet by Alicia Keys and Maxwell. Did he send that as a nod to our summer fling, or was he just sharing a good new song by two of our favorite artists? And what exactly did he mean by sending me Janet Jackson's "Got 'Til It's Gone"? It was impossible to decipher, and the frustration became a kind of foreplay, a buildup before his next trip to New York roughly a year after we'd first met.

He arrived, and the two of us sat in my Brooklyn apartment, awkwardly sipping beers and sweltering in the thick July heat. I remember thinking that this had all been a mistake, a misread. I was preparing myself for a friendly few weeks of platonic activities when he flipped open my laptop and launched Spotify. I watched him skim around for a song, something slow and melty and gorgeous, and then he turned, leaned over, and kissed me. —JENNA WORTHAM

NEXT
YELP FOR SEX WORKERS



SHYAMA GOLDEN



CLAYTON CUBITT



RSN

BUSINESS

THE RISE AND
FALL OF
REDBOOK,
A SITE THAT JOHNS
LOVED AND
SEX WORKERS
COULDN'T
LIVE WITHOUT.

BY ERIC STEUER



VICTOR COBO

1 0 0



Until last summer, pretty much anyone buying or selling sex in the San Francisco Bay Area used myRedBook.com. For more than a decade, the site commonly referred to as RedBook served as a vast catalog of carnal services, a mashup of Craigslist, Yelp, and Usenet where sex workers and hundreds of thousands of their customers could connect, converse, and make arrangements for commercial sex. RedBook tapped into the persistent, age-old, bottomless appetite for prostitution and made it safer and more civilized. The site was efficient, well stocked, and probably too successful for its own good.

Launched in 1999 by a Mountain View, California, tech entrepreneur named Eric “Red” Omuro, RedBook began as a modest hub for mongers (Internet slang for johns) to discuss the local scene and post reviews of

escorts. As it grew, the site expanded beyond the Bay Area, adding sections for Southern California, the Central Coast, Phoenix, Nevada, and the Pacific Northwest. Omuro also added a key functionality—he made it possible for sex workers to advertise their services.

RedBook may have been full of racy talk and the promise of erotic assignments, but the site itself was anything but sexy. Its ugly, bare-bones design was straight out of the early 2000s. It resembled a web page you might use to find a new job or a secondhand bike. If you were careful to stay away from the sections where photos automatically displayed, you could easily browse potential sex partners at work and your coworkers would never suspect a thing.

RedBook was made up of three main elements. The site’s naughty classifieds section contained the sort of ads that used to be the sole domain of alt weeklies’ back pages: “*College Girl Gone Wild* (BUSTY SMART BLONDE),” “Sexy & Sweet Asian Here to Please Your Needs,” and “Morning \$pecials Daddy Let Me Blow Your Mind.” While ads were free to post, advertisers could opt to pay for premium placement.

Then there were dozens of message boards. While the site’s most popular forums had names like “Escort 411,” “Street Action,” and “Domination Station,” RedBook also hosted conversations on topics ranging from baseball to bondage, music to massage parlors. Bruce Boston, a data scientist who works for one of Silicon Valley’s major tech companies, initially came to the site to find out

which strip clubs had the best dancers. He ended up sticking around for four years to join what he describes as the intelligent, provocative, and honest conversations on the site’s forums. “It was great,” he says. “You could have an open discussion about your beliefs and thoughts.” Boston participated in conversations on RedBook about everything from Libertarian politics to swinger sex parties.

But the most valuable part of the site was its reviews section. You could pay \$13 a month for access to the section, where VIP customers shared detailed write-ups of their experiences with escorts, BDSM providers, and erotic masseuses. As part of their reviews, users listed the services they received, as well as details about the provider’s physical attributes. Looking for a well-reviewed Latina under 30 who provides full-body sensual massage in Oakland? Just filter to narrow down your search.

Then, on June 25, 2014, visitors to Red-

1 0 2



Book got a rude shock. Instead of a directory of links to sexy ads, forums, and reviews, they saw a dire-looking alert from the Department of Justice, FBI, and IRS stating that RedBook's domain had been seized. The Feds' message, still up today, asserts that there is probable cause that the site was involved in "money laundering derived from racketeering based on prostitution."

Federal agents arrested Omuro, 54, along with Annmarie Lanoce, a 41-year-old bespectacled mother from Rocklin, California, a suburb of Sacramento. (Lanoce worked for Omuro, helping to moderate RedBook and manage its operations.) Their homes were raided and their computer equipment confiscated. In July, Omuro was charged with using the Internet to facilitate prostitution and 24 counts of money laundering. Lanoce was charged with using the Internet to facilitate prostitution. Released on bond, they were prohibited from going online or associating with former users of the site.

The United States attorney's indictment against Omuro claims he took in more than \$5 million. The site brought in revenue from fees paid by RedBook users for access to the site's enhanced features. It's unclear why the authorities targeted RedBook and not the array of other sites where sex is openly bought and sold. The US attorney's office declined to offer any comment, but its indictment speaks for itself.

Both Omuro and Lanoce initially pleaded not guilty to all charges, but in November Lanoce changed her plea in the hope that it might allow her to avoid a felony sentence in exchange for good behavior. A few weeks later Omuro followed suit and entered his own guilty plea to the charge of using the Internet with the intent to facilitate prostitution, agreeing to forfeit nearly \$1.3 million in cash and property. Omuro's guilty plea marked the first-ever federal conviction of a website operator for the crime of facilitating prostitution. Both Omuro and Lanoce are due in court in March for sentencing.



SAN FRANCISCO'S

GRITTY TENDERLOIN

district is bordered by touristy Union Square on one side and tony Nob Hill on another. In 2012 Twitter installed its lavish new headquarters in an old

art deco building on Market Street, kicking off a surge of corporate moves to the area by the likes of Uber, Spotify, Yammer, and Square. In turn, hundreds of young tech workers have recently relocated to the Tenderloin and are rapidly changing the economics of a neighborhood that has managed to resist gentrification for decades.

That resistance is on full display one afternoon this fall when I take a short walk around the neighborhood. I count five women standing on various corners, some actively waving at cars, others more carefully making low-key eye contact with male drivers as they cruise by. One woman is particularly aggressive. She wears a black tank top with

Photographer Victor Cobo has been shooting images of sex workers in San Francisco's Tenderloin district for more than 15 years.

spaghetti straps, mommish jeans, and a San Francisco Giants sweatshirt tied around her waist. You might mistake her for a lady on her way out to buy groceries, except she's wearing cartoonishly thick lipstick and heavy eye makeup, especially striking in the middle of the day.

I stand about 10 feet from her, near a bus stop. A guy on a Harley stops at a red light, and the woman lewdly thrusts her hips in his direction. The biker rides on, and a police truck pulls up alongside us. The cop in the passenger seat calls her over. She walks toward the car and leans her head into his open window. The officer says something quietly to her, and she walks back to her post. A beat later, the cops are gone, and she continues to hail passersby—just a little more subtly now.

The 38-Geary bus pulls up, lets out a dozen passengers, and picks up a few new ones. When I don't get on the bus, the woman knows I'm not there waiting for a ride downtown. She looks over to me. "Hey. My name's Cathy," she says. "What are you doing today?"

I get flustered and begin to stammer, then manage to blurt out that I'd just come from a meeting and that I'm trying to figure out what to do next.

"You need company?"

I tell her no, I'm good. I step off the curb and quickly cross illegally in the middle of the street. Then I turn back. "Hey," I say to Cathy. "Can I find you on the Internet?"

"Nah," she says. "I used to get RedBook reviews, but they took it down."

Omuro started Redbook so that Bay Area mongers would have a home on the web. It succeeded, ultimately attracting so many users that the site became a full-fledged business, with massive profits. But when RedBook was shut down, the people who were hit the hardest weren't the buyers, but the sellers—sex workers like Cathy for whom the site had made the world's oldest profession significantly less risky.

One of the ways the site reduced danger for workers was by making it easier for them to weed out bad dates, from poor tippers to full-on abusive creeps. Providers could choose to meet only customers who

WIRED *community director* **ERIC STEUER** (@ericsteuer) interviewed Roman Mars for issue 23.02.



were well known and well liked on RedBook's forums, and some workers even required references from other escorts on the site before taking on a new client. "RedBook provided a space to safely negotiate and screen clients that reduced the likelihood of being victimized by predators or cops," says Kristina Dolgin of the Sex Workers Outreach Project, a national advocacy group.

RedBook may be gone, but the migration of the sex trade from the streets to the Internet is only accelerating. Some sex workers use social media to advertise (search Twitter for some combination of the city you're in, and #escort, #incall, or whatever kink you're into). Others have their own websites, often built using special-

ized services like Escort Design—a kind of WordPress for people in the sex industry. But the most common way to connect with clients online is through sites similar to RedBook that have yet to be shut down by the authorities. Scott Cunningham, a Baylor University economics professor who studies prostitution and black markets on the web, says that while exact figures are unknown—no national census has been conducted—he has no doubt that the vast majority of today’s paid sex arrangements originate through the Internet. “Sites like these, and the Internet more generally, have taken most of the action off of the street,” he says. “It’s likely that these websites have actually expanded the market.”

If sex workers simply want to buy an ad, they can still use Cityvibe, Lovings, backpage, and Eros Guide. RedBook was different, in that its vast network of message boards made it possible for workers to not only advertise but ask questions of one another, find support, and even make friends. This is one of the things that Siouxsie Q, a sex worker in Oakland, misses most about RedBook. “We lost a critical resource for building community,” she says. “And building community is already tough enough when you’ve been marginalized and your work is criminalized.” Women used RedBook’s forums to share everything from jokes to medical and financial tips that were useful to people in the sex industry, she says.

Siouxsie’s career in sex work is as diverse as it gets. In addition to seeing a few clients each week for escort and domination services, she writes a sex column for *SF Weekly*, teaches sex classes for couples looking to add spice to their love lives (one of her recent courses was called Monogamaybe), models for fetish websites, and stars in adult films. She was recently nominated for an AVN—the Oscars of porn.

She also hosts and produces two podcasts. *The Whorecast* focuses on the people and politics of sex work—a recent episode featured an interview with a marine who says his side gig as a porn performer cost him his pension. (*The Whorecast* was originally titled *This American Whore*, but a statement from *This American Life*’s Ira Glass convinced Siouxsie to change the name.) Her other podcast is about *Game of Thrones* from the perspective of two sex workers. It’s called *Winter Is Coming ... On Your Face*.

THE REDBOOK CLIENTS WERE NICE. “NERDY, TO BE HONEST.” NOW RACHEL HAS TO DO MORE CAR DATES.

SHE HATES CAR DATES.

Since RedBook closed, “I’ve had immense trouble connecting with new clients,” says Siouxsie Q (left).

But escorting remains a primary source of Siouxsie’s income. And since RedBook was shut down, her business has taken a substantial hit. “I’ve had immense trouble connecting with new clients,” she says. “I have only taken on two or three new people since the site closed, which is a huge drop.” She blames the loss of the site’s massive traffic and reviews section, which was useful in helping clients find dates. Guys can still get Siouxsie’s contact information

through her personal website, but all the positive comments that clients wrote about her over the years vanished from the web the moment RedBook was pulled offline. “Imagine you have a restaurant with a ton of great reviews on Yelp, and then Yelp gets shut down,” Siouxsie says. “All that information is gone, and now it’s hard for people to find out about your restaurant.”

By closing down RedBook, law enforcement made it tough for specialty escorts like Siouxsie to set favorable rates for their services. “Five or six years ago, a bunch of women on the site who did erotic massage got together and were like, ‘What if we all raise our rates by \$20?’ And it totally worked. That can’t happen now.”

Then there’s the reality that so much of the sex workers’ personal information is now in the hands of the authorities. “It’s likely that law enforcement agencies now have people’s IP addresses, email addresses that might include their real names, and credit card information,” says Nadia Kayyali, a staff activist for the Electronic Frontier Foundation. “And one of the trends we’ve seen lately is that everything they get, they keep. It goes into a database somewhere.” The fear is that the sex workers could be surveilled and possibly arrested at any time.

In the wake of RedBook’s shutdown, Kayyali set up a

CONTINUED ON PAGE 108

MY STORY

SWIPE RIGHT,

Get LAID

(FINALLY!)

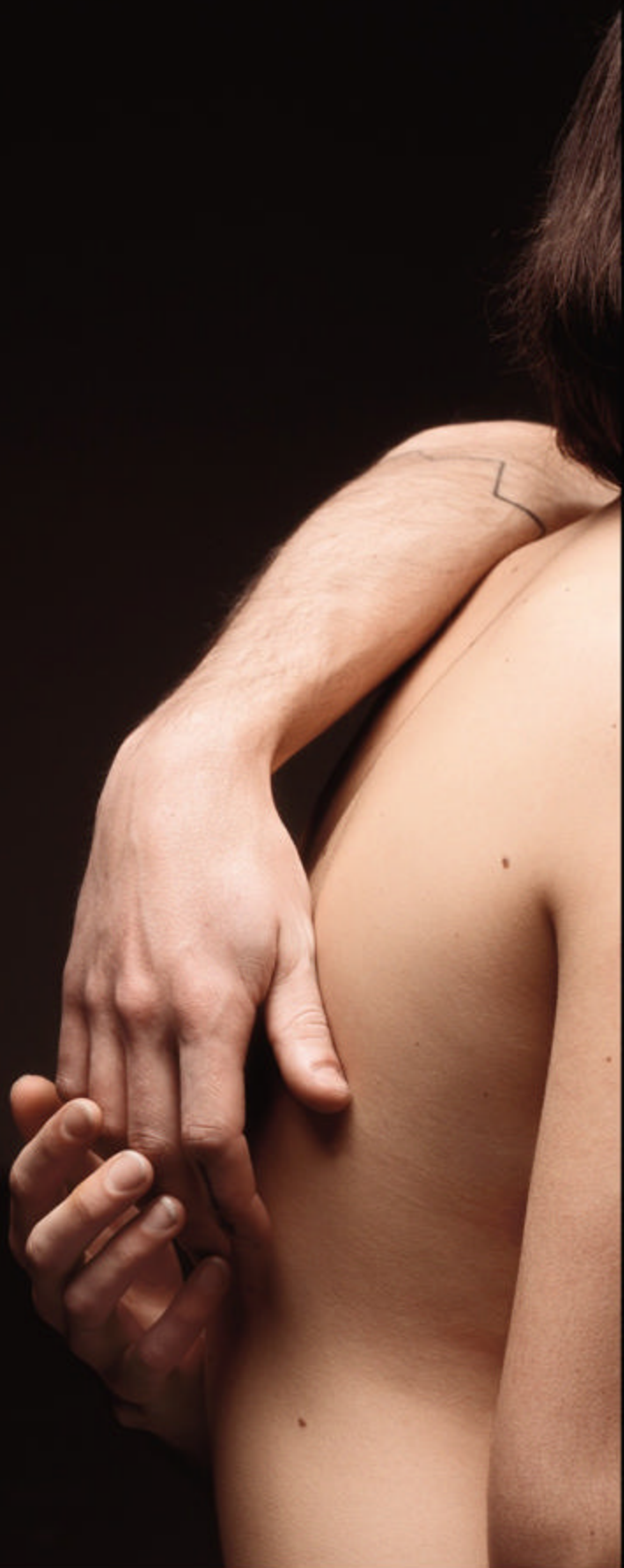
◆ We've all heard of the euphemistic "dry spell," but what I was experiencing was a full-on sex drought. Everyone was having sex, everywhere—my next-door neighbors, my ex, characters on HBO. I hadn't had sex (nor been as much as kissed or groped) in two and a half years. I had to do something more extreme than my usual tepid, OkCupid-enabled dates.

I'd heard about Tinder as a hookup app for straight people. One snowy night last year I signed up, uploaded a few photos, added a Beyoncé quote, and five minutes later I was swiping through available guys within a 6-mile radius of my Brooklyn apartment. It didn't take long to start chatting with a cute cartoonist who made jokes about Joni Mitchell. After flirting for 90 minutes, I invited him over, making him promise, as some kind of lazy safety precaution,

that he wasn't going to murder me.

I didn't even bother to change out of my pajamas. And I didn't end up wearing them for very long. What followed was a Tinder-enabled winter and spring that surpassed my college years in promiscuity. Among my hookups was a social media manager, a stylist who always complimented my lingerie, and a guy who co-developed an app that's almost a household name.

By summer, Tinder had lost its luster for me. Every guy I encountered either had abhorrent social skills or seemed to want a pen pal he could occasionally sext. Or maybe I just wanted something more meaningful? My sex life faded along with my nightly swiping habit. But I keep the app on my phone, ready to browse, just in case. —MARISA MELTZER







Risky Business

CONTINUED FROM PAGE 105

workshop, held in an unpublicized location in San Francisco, to teach sex workers how to anonymize their online communications and transactions. She explained to about 20 women the basics of the Tor browser and offered tips for improving password security. The attendees' questions were smart and informed, and she was impressed by the amount of thoughtfulness in the room. "There are sex workers with PhDs," she says. "There are sex workers who know how to code."

Then again, the people who are most likely to be targeted by police are those with the least amount of experience with technology. "They're working on the street and probably operating mostly with phones," Kayyali says. So at her training session she also talked about the importance of basic security measures like using passcodes and text message encryption. "They're relatively simple things but can provide some measure of security on the street," she says. "And that's more important than ever—we're seeing more workers out on the streets now because of the closure of RedBook."

At least in the short term. Cunningham, the Baylor economist, points to a study he coauthored in 2011, which suggests that the Internet may have decreased the number of sex workers age 25 to 40 who work on the street.

One woman who relied on RedBook's free ad listings calls herself Rachel, a 45-year-old sex worker who's been operating in the streets and residential hotels of San Francisco's Tenderloin district for the better part of 20 years. She's a longtime crack addict and often homeless, but today she's neat, clean, and fashionably dressed in a slouchy sweater, leggings, and new cowboy boots. If you walked by her on the street, you'd never guess what she did for money.

After a few minutes of conversation on the corner of Post and Hyde and negotiation of a \$60 fee for her time, Rachel is leading me by the hand past a firehouse, a medical weed clinic, and a drag bar. She breaks away to talk to three guys across the street. After a minute, she pockets a small baggie from one of the men, hugs him, and runs back to me. She grabs my hand again and pulls me toward the front step of the America Hotel, one of the dozens of single-room-occupancy hotels that house the

Tenderloin's poor. We walk past a gate and up a filthy flight of carpeted steps to meet a man sitting behind a thick plastic wall with a head-sized hole cut out toward the bottom. He nods at Rachel and glares at me.

"Papa, this is my friend," Rachel says. The clerk is in his early fifties, wearing a black hooded sweatshirt with the YouTube logo embroidered across the front. He asks me for \$10 and tells me that I need to leave a photo ID with him while I'm visiting.

Rachel and I climb another two flights of stairs and arrive at her room. There isn't enough stuff inside for it to qualify as a mess. But it does not feel clean. There's a bare twin-size mattress, a sink, and a dresser with an old TV playing an episode of *The Big Bang Theory*. There are two duffel bags in the corner near the window. Rachel's clothes and toiletries spill out of them.

She tells me that she moved to the Bay Area from the East Coast in the early '90s and quickly got a gig stripping at the now-shuttered Market Street Cinema. "I'd danced in other places before, and let's just say that the Market Street job was 'stripping plus,'" she laughs.

Rachel pulls an old Lenovo laptop out of her oversize leopard-print purse and shows me an ad for her services that she placed on Lovings, which caters to escorts, sensual massage therapists, and others providing erotic services in San Francisco. She's a new user on the site and paid \$120 for the ad to run for a month. Rachel says one of her customers let her use his credit card to pay for it.

She tells me that while she always had a steady stream of calls from guys on RedBook, she hasn't had many responses to her Lovings ad. I browse around on the site, and it's not hard to see why her post hasn't taken off. Most of the women advertising on Lovings appear to be significantly younger than Rachel. Also, their photos were shot by pros, or at least by friends with decent SLRs and basic Photoshop skills. In contrast, Rachel's photos look like cruddy phone pics taken in a squalid hotel room.

"It's been like starting over," she says of RedBook's shutdown. For years most of her clients were guys on RedBook who got her phone number through other users in the forums, "guys who knew me and could vouch for me," she says. Although she did encounter a few jerks over the years, she says, she almost always had good experiences with the men she met through the site. "They were nice and normally kind of shy," she says. "Nerdy, to be honest."

Recently Rachel's customers have tended to be men she meets offline, guys just milling about or driving around the neighborhood, looking for action. She doesn't like walking the streets, because it's tiring and scary, and she especially hates doing car dates because they're dangerous. But the reality is that she's had to do more of both since RedBook closed. "I still have a couple friends from the site who get in touch, but not many," she says. "I hope another RedBook comes around at some point. It made life a lot easier." ■

COLOPHON

FANTASIES THAT HELPED GET THIS ISSUE OUT:

Meeting *An Officer and a Gentleman*'s Richard Gere behind a sugar factory; old-style office sex on uncomfortable modern furniture; extended takes of Channing Tatum and Mark Ruffalo sparring in *Foxcatcher*; the end of Drynuary; sleeping 12 hours a night; Hilary's breakfasts; being dominated by the Angry Nerd; the return of good TV; spooning with Sadie forever #RIPkitty; getting a massage from Jon Snow in a natural hot spring; the beach at sunset; a deep connection; a checking account above \$1,000 after rent; toast; being able to do the paint-soaked body role in Neon Hitch's "Fuck U Betta" video; DILFs; another nondate with my nonspouse; a perfectly organized house; an affordable apartment in San Francisco that allows pets; a good nut trampoline; a chilled bottle of Sauv blanc waiting for me when I get home; threesomes with my best friend; hundred dolla bills, y'all!; publishing The Awl's new-office memo.

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by Robert Capps



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